

UNITED STATES ATOMIC ENERGY COMMISSION

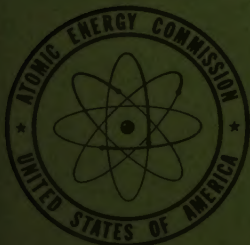
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NUCLEAR SCIENCE ABSTRACTS

Nuclear Science Abstracts is issued twice monthly throughout the calendar year by the Atomic Energy Commission. It is intended primarily to serve scientists and engineers working within the Atomic Energy Project by abstracting as completely and as promptly as possible the literature of nuclear science and engineering. It covers not only the unclassified and declassified research reports of the Atomic Energy Commission and its contractors, but also material in its field of interest which appears in technical and scientific journals and unpublished research reports of government agencies, universities, and industrial research establishments.

INDEXES

Nuclear Science Abstracts is fully indexed by author, subject, and report number. Annual index issues are prepared for each volume, and the next cumulated index will appear in volume 10(1956) covering volumes 5-10. A cumulated index to volumes 1-4 was issued as volume 4, No. 24B, Dec. 30, 1950 covering authors, subjects, nuclides, and report numbers. The 24th number of volumes 5 and 6 contain indexes covering the individual volumes and a completely cumulated Numerical Index of Reports.

Each issue of volume 7(1953) contains an author index to abstracts in that issue and a supplement to the Numerical Index of Reports. Subject and author indexes, as well as a cumulation of the Numerical Index of Reports, covering three-month periods are issued as supplements to the sixth, twelfth, and eighteenth issues. The 24th issue will be the annual index for the year, superseding the three index supplements mentioned above.

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GUIDE TO ABSTRACT WRITING

1. *Purpose.* It is very important that a paper be accompanied by an abstract, preferably appearing at the beginning. This abstract is not part of the paper—it is an adjunct intended to convey briefly the content of the paper, to draw attention to all new information and to the main conclusions. It should be directly informative, not merely indicative.

2. *Style of Writing.* The abstract should be written concisely and in normal rather than abbreviated English. Where possible, standard terms should be used and unnecessary contracting should be avoided. The third person is preferable. Mixed tenses, and both indicative and imperative forms should be avoided.

It should be presumed that the reader has some knowledge of the subject, but has not read the paper. He may not even have the paper available at all, if he is working with the abstract journal only. The abstract should, therefore, be intelligible in itself, without reference to the paper; for example, it should not cite sections or illustrations as a substitute for a statement of their content.

3. *Content.* The title of the paper is usually read as part of the abstract, therefore repetition of the title in the opening sentence of the abstract should be avoided. If the title is insufficiently comprehensive to indicate the subjects covered or the objects of the investigation, the opening sentence should make this clear.

The abstract should state newly observed facts, conclusions of an experiment or argument and, if possible, the essential parts of any new theory, treatment, apparatus, technique, etc.

It should contain the names of any new compound, and any new numerical data, such as physical constants; if this is not possible it should draw attention to them. It is important to refer to new items and observations, even though they may be incidental to the main purpose of the paper.

When giving experimental results, the abstract should indicate the methods used; for new methods, the basic principle, range of operation, and degree of accuracy should be given.

4. *Detail of Layout.* It is impossible to recommend a standard length for an abstract. It should, however, be concise and should not normally exceed 200 words. References should be omitted from the abstract whenever possible.

AUTHOR INDEX

For each reference the digit preceding the dash is the volume number and digits after the dash are the abstract number.

AARTS A J J
7-2014
ABD-EL HALIM F M
7-1920 7-1921
ABDELNABI I
7-2903
ABELE R K
7-2049
ABKOWITZ STANLEY
7-1997
ABRAGAM A
7-3209
ABRAHAM BERNARD M
7-2330
ACHERMAN WALTER L
7-3428 7-3427
ACQUISTA N
7-2427
ADAIR R K
7-2894
ADAM J A
7-3359
ADAMS M
7-2552
ADAMS P T
7-3030
ADLOFF JEAN PIERRE
7-3043
AGENO M
7-2065 7-2626 7-2871
AHLBRECHT ARTHUR H
7-3405
AHRENS L H
7-2040
AICHINGER FRANZ
7-2969
AIR CLEANING LAB
HARVARD UNIV SCHOOL
OF PUBLIC HEALTH
7-2542
AIR FORCE RADIATION LAB
UNIV OF CHICAGO
7-2729
AITKEN I D
7-1914
AKHIEZER A I
7-3133 7-3134
ALADEV I T
7-3068
ALBERT P
7-3093
ALBERT PHILIPPE
7-2770
ALBRECHT H O
7-3256
ALBURGER D E
7-2660 7-3162
ALDERMAN ILO M
7-2742
ALDRICH L T
7-2040
ALEXANDER E
7-2254
ALFRED UNIV
7-1940 7-2281 7-3384
ALIKHANYAN A
7-3486
ALLCOCK G R
7-2868
ALLEN BENNET M
7-1872
ALLEN BRUCE
7-2473
ALLEN C M
7-1966
ALLEN K W
7-2581
ALLEN ROBERT E
7-2819 7-3146
ALLEN S
7-2815
ALLISON E B
7-3073 7-3372 7-3424
ALLRED J C
7-3513
ALMQUIST SUNE
7-2374
ALMQUIST E
7-2581
ALTAR W
7-3668
ALTER A J
7-3308
ALTMAN K I
7-2966 7-2982
ALTSHULER SAUL
7-2676 7-2912
AMBLER E
7-3562
AMES D P
7-2654
AMES LAB
7-2097 7-2318 7-2496
7-2506 7-2605 7-2824
7-2836 7-2930 7-3007
7-3033 7-3034 7-3039
7-3040 7-3090 7-3284
7-3349 7-3373 7-3540
AMHERST COLL
7-2558 7-2941 7-3437
AMITH AVRAHAM
7-2601
ANDEREGG JOHN A
7-3033
ANDERSEN E
7-2362
ANDERSON CARL E
7-2822
ANDERSON E C
7-2602
ANDERSON J M
7-3184
ANDERSON L C
7-2940
ANDREEV E A
7-3057
ANDREEVSKII A K
7-2282
ANDREW ALAN
7-2418
ANDREW E R
7-3579
ANDREWS GOULD A
7-3334
ANDRIANOVA T I
7-3057
ANGELL C E
7-3173
ANGEVINE D M
7-2744
ANKER H S
7-2960
ANNIS M
7-2916
ANTHONY JEAN-PIERRE
7-2074
APBLET T W R JR
7-2572
APPLIED FISHERIES LAB
UNIV OF WASH
7-2461
APPLIED RESEARCH LABS
GLENDALE CALIF
7-2933
APPLIED SCIENCE RESEARCH
LAB UNIV OF CINCINNATI
7-1973
ARASE R
7-2897
ARBTIN EMIL JR
7-3090
ARDRAN G M
7-3331
ARGONNE NATIONAL LAB
7-1911 7-1922 7-1923
7-1924 7-1936 7-1947
7-1954 7-1956 7-1970
7-1971 7-2050 7-2051
7-2052 7-2116 7-2117
7-2182 7-2183 7-2216
7-2437 7-2518 7-2698
7-2715 7-2725 7-2726
7-2727 7-2728 7-2751
7-2752 7-2765 7-2851
7-2853 7-2856 7-2876
7-2877 7-2993 7-3036
7-3087 7-3107 7-3251
7-3258 7-3386 7-3397
7-3467 7-3553 7-3584
ARMOUR RESEARCH
FOUNDATION
7-2565 7-3361 7-3423
7-3426 7-3458 7-3459
ARMSTRONG A H
7-3513
ARMY MEDICAL RESEARCH
LAB FORT KNOX
7-1868 7-2724 7-2737
7-2852 7-3323
ARNHEIM J
7-2948
ARNOTT D G
7-1910
ARON JACK
7-2420
ARONOFF S
7-2760
ARONSON ANNA
7-3009
ARTHUR PAUL
7-2840
ASCHENBRAND LEONARD M
7-2357
ASHBY VAL J
7-2899
ASHKIN JULIUS
7-3188 7-3190
ASHMORE JAMES
7-2979
ASLING C WILLET
7-2720
ASTBURY J P
7-3487 7-3490
ATEN A H W JR
7-2187 7-2188 7-3268
ATOMIC ENERGY PROJECT
UNIV OF CALIF
LOS ANGELES
7-1865 7-1872 7-2489
7-2719 7-2732 7-2733
7-2782 7-2944 7-3042
7-3185 7-3300 7-3394
ATOMIC ENERGY PROJECT
UNIV OF ROCHESTER
7-2220 7-2324 7-2946
7-2959 7-2960 7-2982
7-3002
ATOMIC ENERGY PROJECT
WESTERN RESERVE UNIV
7-2730
ATOMIC ENERGY RESEARCH
ESTABLISHMENT HARWELL
DERKS ENGLAND
7-1914 7-1987 7-2008
7-2018 7-2028 7-2316
7-2603 7-2723 7-2777
7-2808 7-2864 7-2879
7-2918 7-2994 7-2995
7-3073 7-3075 7-3088
7-3136 7-3146 7-3151
7-3156 7-3157 7-3229
7-3230 7-3252 7-3253
7-3331 7-3358 7-3372
7-3424 7-3547 7-3598
ATOMIC PHYSICS LAB
NATIONAL BUREAU OF
STANDARDS
7-2427
ATTIX FRANK H
7-2057
AUDRIC B N
7-3512
AUERBACH STEWART H
7-2736
AVERBACH B L
7-2670 7-2671 7-2672
7-2815 7-2816 7-3130
AVIGNON PAUL
7-2197
AXTMANN ROBERT C
7-3258

- AYANT YVES
 7-2134 7-2648
 AZIZ P M
 7-2298
- BABCOCK AND WILCOX CO
 7-1975 7-2295 7-2303
 7-2809
 BACHMAN C H
 7-3503
 BACON R C
 7-2636 7-2857
 BACQ Z M
 7-2968
 BADGLEY FRANKLIN I
 7-3183
 BAER WILLIAM
 7-2622
 BAG A A
 7-3054
 BAGARYATSKII YU A
 7-2310
 BAGGETT BILLY
 7-3006
 BAIN GEORGE W
 7-2558 7-3437
 BAINBRIDGE KENNETH T
 7-2120
 BAIR J K
 7-2126
 BAK BORGE
 7-3375 7-3378
 BAKER J E
 7-2793
 BAKER J M
 7-2881
 BAKER O H
 7-2295 7-2303 7-2809
 BAKER R G
 7-2071 7-2403
 BAKER WILLIAM K
 7-1883
 BALDER R B JR
 7-2727
 BALDIN A M
 7-3180
 BALDRIDGE HENRY DAVID JR
 7-3052
 BALDWIN G C
 7-2464
 BALENT R
 7-3214
 BALIS M EARL
 7-2219
 BALL CHARLES D
 7-1959
 BALL RUSSELL M
 7-3536
 BALL W P
 7-2323
 BALLENTINE ROBERT
 7-3028 7-3038 7-3298
 7-3341
 BALLINI RENE
 7-2068 7-3275
 BALLOU JOHN E
 7-1908
 BANDTEL KENNETH C
 7-2156
 BANDYOPADHYAY G
 7-2703
 BANKS A A
 7-3023
 BANKS CHARLES V
 7-3007
 BAR-GADDA I
 7-3003
 BARBER W C
 7-2677
 BARENDSEN G W
 7-2064
 BARFORD N C
 7-2080
 BARKAS WALTER H
 7-3285
 BARKER K H
 7-3168
 BARKLEY LLOYD B
 7-3053
 BARLOW G B
 7-1937
 BARLOW J C
 7-2240
 BARNES R G
 7-3566
 BARNEVELD W
 7-2079
 BARRETT J C
 7-1995
 BARRETT PAUL H
 7-2015
 BARRETT THOMAS F
 7-1907
- BARRETT W T
 7-2998
 BARRON E S GUZMAN
 7-1874 7-1875 7-1876
 BARRY EUGENE V
 7-3326
 BARSH MAX K
 7-2257
 BARTHOLOMEW G A
 7-3635
 BARTLETT M S
 7-3491
 BARTLETT PAUL D
 7-3016
 BARTOL RESEARCH
 FOUNDATION
 FRANKLIN INST
 7-2638
 BARTON J C
 7-2335
 BARTON R
 7-2100
 BARTZ D
 7-2548
 BASOLO FRED
 7-2754 7-2990
 BASSOMPIERRE ANDRE
 7-2393 7-2647
 BASTIN-SCOFFIER
 GENEVIEVE
 7-3274
 BATE G L
 7-3518
 BATES T F
 7-2299
 BATTAT M E
 7-2655
 BATTLE MEMORIAL INST
 7-1986 7-1988 7-1996
 7-2525 7-2550 7-2806
 7-2807 7-2996 7-3095
 7-3446 7-3447 7-3449
 BAUER FRANZ K
 7-1907
 BAUER RICHARD
 7-3352
 BAUSCH AND LOMB
 OPTICAL CO
 7-3255
 BAYARD ROBERT T
 7-2622
 BAYLY J G
 7-2398
 BEAMS HAROLD W
 7-2715
 BEAN R C
 7-3051
 BEATTY ALVIN V
 7-1878 7-1890
 BEATTY K O JR
 7-2268
 BEAUMONT C F A
 7-3477
 BEAUSSIER JACQUES
 7-3505
 BECK PAUL A
 7-2561
 BECKER G E
 7-2677
 BECKER J
 7-2360
 BECKER R L
 7-2875
 BECKETT CHARLES W
 7-1994 7-2846 7-3108
 BECKMAN C H
 7-3340
 BEGHIAN L E
 7-3224
 BEGUN G M
 7-3148
 BEHN V C
 7-3061
 BEISCHER D E
 7-2789
 BELANGER LEONARD F
 7-2492
 BELCHER R
 7-3370 7-3371
 BELKNAP ELSTON L
 7-2245
 BELKOV G
 7-3118
 BELL J S
 7-2161 7-3229 7-3230
 7-3598
 BELL P R
 7-2030
 BELL W A
 7-2356
 BELL AIRCRAFT CORP
 7-3419
 BELLAMY E H
 7-3207
- BELLIBONI G
 7-2017
 BENADE J M
 7-2449
 BENDER A
 7-3392
 BENDICH AARON
 7-2487
 BENDT PHILLIP J
 7-2169
 BENEDICT M
 7-2549
 BENNETT EDWARD L
 7-1957 7-3030
 BENNETT LESLIE R
 7-1865
 BENNETT WINIFRED
 7-1958
 BENOIST-GUEUTAL
 PIERRETTE
 7-2692 7-3634
 BENSON A A
 7-2750
 BERBEE J G
 7-3340
 BEREZHIANI V M
 7-2309
 BERG DANIEL
 7-3396
 BERGENDAHL M H
 7-3081
 BERGMANN JOHN G
 7-2990
 BERKEY REYNOLD A
 7-2495
 BERLY EDWARD
 7-2542
 BERMAN ARTHUR I
 7-3606
 BERMAN C Z
 7-2228
 BERNARD MICHEL YVES
 7-2025 7-2587
 BERNARD RENE
 7-2938
 BERNAS RENE
 7-2042 7-2194 7-2925
 BERNSTEIN RICHARD B
 7-3401
 BERONI E P
 7-2555
 BERRY C E
 7-2048
 BERRY MYRON G
 7-3514
 BERRY V J
 7-2292
 BERSTEIN IRVING A
 7-1958 7-2373
 BERTHELOT A
 7-2068
 BERTOLUZZI M
 7-3333
 BETHE H A
 7-2900
 BETZ H
 7-3317
 BEUN J A
 7-3572
 BEVAN D J M
 7-2008
 BEVER M B
 7-3453
 BEVILACQUA F
 7-3366
 BEYDON JACQUELINE
 7-2194 7-2274
 BIAGINI CARISSIMO
 7-2475
 BIANCO D R
 7-2774
 BIDDULPH ORLIN
 7-2461
 BIDDULPH SUSANN F
 7-2461
 BIEHL A T
 7-3214
 BIELER B H
 7-3432
 BIERSTEDT P E
 7-3391
 BIGELEISEN JACOB
 7-3496
 BILLEN DANIEL
 7-2965 7-2967
 BILLINGS CHARLES
 7-2542
 BINGEMANN M E
 7-2241
 BINSTED W V
 7-2311
 BIOLOGICAL LAB
 COLD SPRING HARBOR
 7-2456

- BIOLOGICAL LABS
 HARVARD UNIV
 7-1905
 BIOPHYSICAL LAB
 HARVARD MEDICAL SCHOOL
 7-1905 7-2748 7-2749
 BIRAM J G S
 7-2316
 BIRAM M B
 7-2723
 BIRGE ROBERT W
 7-3220
 BIRKHOFF R D
 7-2694
 BIRKS J B
 7-2419
 BISHOP J F W
 7-3132
 BITTER F
 7-3115
 BJORNERUD E K
 7-3178
 BLACK F A
 7-3615
 BLACKADAR A K
 7-3546
 BLAHA ELI
 7-2495
 BLAISE JEAN
 7-2645
 BLAKNEY ROBERT M
 7-2324
 BLATT J M
 7-2112
 BLATZ HANSON
 7-2896
 BLAU MONTE
 7-1913
 BLEANEY B
 7-2581 7-3580
 BLEULER E
 7-2621 7-3198 7-3219
 BLEWETT M HILDRED
 7-2410
 BLIZNYAK N V
 7-3054
 BLOCH F
 7-2107
 BLOEMBERGEN N
 7-2390
 BLOK J
 7-2166 7-2167
 BLUE J W
 7-3198
 BLUM JACQUES M
 7-2926
 BLUMENTHAL I S
 7-2669
 BOBTELSKY M
 7-3003
 BOBYKIN B V
 7-2326
 BOCHVAR D A
 7-2262
 BOEKER G F
 7-1974
 BOELHOUWER M
 7-3268 7-3278
 BOGAARDT M
 7-3581
 BOGARD ANDREW D
 7-3452
 BOGART LOUIS
 7-2059
 BOHR AAGE
 7-3281
 BOLEY F I
 7-3265
 BOLLINGER LOREN E
 7-2350
 BOLSTER M F
 7-3109
 BONCH-BRUEVICH V L
 7-2204
 BOND A C
 7-2541
 BOND V P
 7-1873
 BONESSA CAMILLO
 7-2474
 BONETTI A
 7-2833 7-2867
 BONILLA CHARLES F
 7-2792
 BONINO J J
 7-2041
 BONNEVAY GEORGES
 7-2209
 BOOTH E
 7-3359
 BOPP FRITZ
 7-2214
 BORIE B
 7-3186
 BORKOWSKI C J
 7-3679
 BOROVSKII I B
 7-3050
 BORSELLINO A
 7-2681
 BORTNER T E
 7-3236
 BORUP RICHARD E
 7-3366
 BOSCH CARL
 7-2361
 BOSTOCK W
 7-1969
 BOSTON CHARLES R
 7-2754
 BOUCHEZ R
 7-3637
 BOULANGER F
 7-1952
 BOULLE ANDRE
 7-2532
 BOURGEOIS J
 7-3248
 BOUTRY GEORGES-ALBERT
 7-3233
 BOWELL E
 7-2135
 BOWERS K D
 7-2881 7-3580
 BOWMAN F E
 7-2417
 BOYCE THOMPSON INST
 FOR PLANT RESEARCH INC
 7-2484
 BRACCI A
 7-2086 7-2143 7-3226
 BRACE KIRKLAND C
 7-2471
 BRADLEY D C
 7-1919 7-1920 7-1921
 BRADLEY D F
 7-2750
 BRADNER HUGH
 7-2945
 BRADY J
 7-2766
 BRANDAO F A G A
 7-1925
 BRANDES GUNTER
 7-3015
 BRANNEN CECIL G
 7-2797
 BRANDSEN B H
 7-2904
 BRASCH ARNO
 7-3319
 BRASUNAS ANTON DE S
 7-2312
 BRAUER G
 7-3409
 BRAVO JUSTO B
 7-1917
 BRAY P J
 7-3568
 BREIT G
 7-2641 7-2853
 BREITLING GERHARD
 7-2083
 BRENNER P
 7-2001
 BRENT ROBERT L
 7-2463 7-3322
 BRESLIN A J
 7-1895
 BRETONNEAU PIERRE
 7-2070 7-2695
 BREWER L
 7-2588
 BREWER P I
 7-3371
 BRICE M K
 7-2929 7-3632
 BRIDGE H S
 7-2916 7-3465
 BRIERE M
 7-2034
 BRIGHAM E
 7-2967
 BRINKLEY T A
 7-2400
 BRIX PETER
 7-2882
 BROBECK W
 7-3600
 BROCHARD JEAN
 7-2650
 BROCKMAN F G
 7-2387
 BRODING R A
 7-3537
 BROECKER WALLACE S
 7-3430
 BROLLEY JOHN E JR
 7-2407
 BROOKHAVEN NATIONAL LAB
 7-1857 7-1965 7-1972
 7-1989 7-2118 7-2119
 7-2120 7-2121 7-2176
 7-2198 7-2317 7-2387
 7-2399 7-2410 7-2643
 7-3187 7-3496 7-3511
 BROPHY GERALD P
 7-3077
 BROTZEN F R
 7-2304
 BROWN A A
 7-2446
 BROWN GEORGE BOSWORTH
 7-2219 7-2487
 BROWN HERBERT C
 7-2540 7-2541 7-3665
 BROWN LAURIE M
 7-3166
 BROWN LAWRENCE M
 7-2746
 BROWN W M COURT
 7-2734
 BROWN UNIV
 7-2664
 BROWNELL GORDON L
 7-3538
 BROWNELL L E
 7-2721 7-2940 7-3468
 BROYLES C D
 7-2188
 BRUCER MARSHALL
 7-2031
 BRUECKNER K A
 7-2163 7-3659
 BRUES AUSTIN M
 7-2725 7-2726 7-2727
 7-2728 7-2739
 BRUHN JORGEN
 7-3375 7-3378
 BRUN J
 7-3582
 BRYANT BURL E
 7-2761 7-2788
 BUBE RICHARD H
 7-3164
 BUCHANAN J G
 7-2750
 BUCHANAN J S
 7-3487 7-3490
 BUCK WILLARD E
 7-2347
 BUDINI P
 7-2174 7-2174 7-2674
 7-2915 7-3480
 BUDY ANN M
 7-2476
 BUECHNER W W
 7-3466
 BUERS R
 7-2043
 BUETTNER KONRAD
 7-2229
 BUNKER M E
 7-2654 7-3257
 BUNTON C A
 7-1960
 BURCHAM W E
 7-3607
 BUREAU OF MINES
 7-2560 7-2569 7-3082
 BUREAU OF MINES
 COLLEGE PARK MD
 7-1995
 BURFORD DOROTHY D
 7-3341
 BURG ANTON B
 7-1915
 BURGWARD G M
 7-2615
 BURKART M W
 7-2305 7-2617
 BURNETT J R
 7-3386
 BURNETT W T JR
 7-2983
 BURSON S B
 7-2182
 BURSTONE M S
 7-2237 7-3309
 BUSH S G
 7-2724
 BUSH W E
 7-2577
 BUSSO R H
 7-1943
 BUTEMET F D S
 7-2864
 BUTT D K
 7-3525
 BUTTLAR H V
 7-2693

- BUYLE-BODIN MAURICE
 7-2648 7-3203
 BYERRUM RICHARD U
 7-1959
 BYRD CAROL H
 7-3007
- CADDELL J R
 7-2781
 CADOFF IRVING
 7-3103
 CADORIN D
 7-3128
 CADY RICHARD T
 7-2585
 CAIANIELLO E R
 7-2212 7-3292
 CAIRD R S
 7-2147
 CALIFORNIA INST OF TECH
 7-2026 7-2547 7-2608
 CALIFORNIA RESEARCH AND
 DEVELOPMENT CO
 LIVERMORE
 7-2296
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 COLL OF AGRICULTURE
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 CALIFORNIA UNIV DAVIS
 COLL OF AGRICULTURE
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 CALLAHAN CLARENCE M
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 7-1902 7-1903
 CANCER RESEARCH INST
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 HOSPITAL BOSTON
 7-1864 7-2218 7-2954
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 CAMISIUS COLL
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 CAP FERDINAND
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 CARBIDE AND CARBON
 CHEMICALS CO K-25
 7-2349 7-2543 7-2793
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 CARBIDE AND CARBON
 CHEMICALS CO G-12
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 CARROLL R M
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 7-1918
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 RIO DE JANEIRO BRAZIL
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 CANADA
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 7-1968
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 7-2058
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 7-1933
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 CHARPAK GEORGES
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 7-2154
 CHAUDRON GEORGES
 7-2770
 CHEMICAL DEFENCE
 EXPERIMENTAL
 ESTABLISHMENT
 PORTON WILTS ENGLAND
 7-3005
 CHEMICAL INSPECTORATE
 MINISTRY OF SUPPLY
 LONDON ENGLAND
 7-3359
 CHEMICAL LAB
 UNIV OF KANSAS
 7-1917
 CHEMICAL RESEARCH LAB
 TEDDINGTON MIDDLESEX
 ENGLAND
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 CHEMLA MARIUS
 7-1961 7-3059
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 CLASS C M
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 7-1873
 COLE RICHARD W
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 COLLETTE RICHARD L
 7-3403
 COLLI LAURA
 7-3533
 COLORADO UNIV
 7-2591

- COLUMBIA RADIATION LAB
 COLUMBIA UNIV
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 COLUMBIA UNIV
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 COLUMBIA UNIV
 SCHOOL OF ENGINEERING
 7-1974
 COLUMBIA UNIV
 SCHOOL OF MINES
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 COMAR C L
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 CONARD G P II
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 CONES H N
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 CONGDON CHARLES
 7-1899
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 CONKLIN G L
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 CONNECTICUT UNIV
 7-2609
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 COOKE-YARBOROUGH E H
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 COOLEY R A
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 COOPER MARGARET
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 COPP S S
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 COPPENS RENE
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 CORK J M
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 CORLISS L M
 7-2387
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 CORNELL UNIV
 7-2771
 CORNELL UNIV MEDICAL
 COLL
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 CORRY R T
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 CORTELLESSA G
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 OLIVIER
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 CROOKS H E
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 CROUTHAMEL C E
 7-1924 7-2853
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 CRYOGENIC LAB
 OHIO STATE UNIV
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 CZIKK A
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 7-2084
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 RESEARCH CENTER
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 DEPARTMENT OF MINES AND
 TECHNICAL SURVEYS
 CANADA
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 TECHNICAL SURVEYS
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 DESCHAMPS YVON
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 DE SHALIT A
 7-2399
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 7-3143

- DETRICK LAWRENCE E
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7-2422
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7-2232
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MATERIALS AEC
7-3078 7-3431 7-3434
7-3438
- DIVISION OF REACTOR
DEVELOPMENT AEC
7-2799
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7-2021 7-2024
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CALIF INST OF TECH
7-2813
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- EDWARDS S F
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RESEARCH LAB
WESTERN RESERVE UNIV
7-2759
- ELECTRONA CORP
7-2361
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7-2296
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- ENATSU H
7-3177
- ENCE E
7-3461
- ENDO S
7-3570
- ENGEL S
7-3393
- ENGELDER THEODORE C
7-3618
- ENGINEERING RESEARCH
INST UNIV OF MICH
7-2940
- ENNO R A H
7-2248
- ENNUYER A
7-3333
- ENTENMAN C
7-2962
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7-3163
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7-3497
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7-3466
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7-3445
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7-2892

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 EVSTIGNEEV V B
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 EYRING HENRY
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 EYRING LEROY
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 FACCHINI UGO
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 FALK-VAIRANT PAUL
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 FEDERAL TELE-
 COMMUNICATION LABS INC
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 FEENBERG E
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 FORDHAM UNIV
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 CENTER PRINCETON UNIV
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7-3462
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7-2093
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7-1914
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7-2708 7-3271
- NATIONAL BUREAU OF
STANDARDS
7-2053 7-2427 7-2718
7-2746 7-2767 7-2786
7-2841 7-2846 7-2896
7-3139
- NATIONAL RESEARCH
COUNCIL DIV OF GEOLOGY
AND GEOGRAPHY
7-1983
- NATIONAL RESEARCH
COUNCIL OF CANADA
7-3118
- NAVAL MEDICAL RESEARCH
INST BETHESDA
7-1871 7-2058 7-2972
7-3052
- NAVAL ORDNANCE LAB
7-2058
- NAVAL RADIOLOGICAL
DEFENSE LAB
7-1873 7-2061 7-2226
7-2227 7-2261 7-2961
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- NAVAL RESEARCH LAB
7-2019 7-2553 7-3452
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- NAVAL RESEARCH LAB
UNIV OF WIS
7-3470
- NEARY G J
7-1880
- NEBRASKA UNIV
7-3234
- NEDZEL V ALEXANDER
7-3205
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7-2489
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7-2593 7-2619
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HOSPITAL BOSTON
7-2951 7-3302
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NEW YORK CITY
7-2977
- NEW YORK OPERATIONS
OFFICE AEC
7-2300 7-2592 7-2898
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- NEW YORK STATE COLL OF
CERAMICS ALFRED UNIV
7-3089
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7-1966 7-1993 7-2263
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COLL OF ENGINEERING
7-3093 7-3546
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7-2243

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 POSTGRADUATE COLL
 OF MEDICINE
 7-2243
 NEWTH J A
 7-3487 7-3490
 NEWTON J O
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 7-2093 7-3641
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 7-2533 7-3030
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 7-2567
 NORDLIN H G
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 NORMAN AMOS
 7-3185
 NORMAN BRIDGE LAB OF
 PHYSICS
 CALIF INST OF TECH
 7-2059
 NORMAND C E
 7-2597
 NORRIS L
 7-1906
 NORRIS WILLIAM P
 7-3036
 NORTH AMERICAN AVIATION
 INC
 7-1991 7-2267 7-2395
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 COLL
 7-2268
 NORTHWESTERN UNIV
 7-2754 7-2990 7-3155
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 7-3475
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 7-2697
 NOTRE DAME UNIV
 7-2561
 NOWOTNY H
 7-2773
 NOYES RICHARD M
 7-2763
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 7-2035
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 SEBASTIAN
 7-2469
 NURY GEORGE
 7-2325
 NUSSBAUM R H
 7-3273
 NYBOM N
 7-2735

 OAK RIDGE INST OF
 NUCLEAR STUDIES
 7-2454
 OAK RIDGE NATIONAL LAB
 7-2009 7-2030 7-2049
 7-2239 7-2306 7-2307
 7-2358 7-2422 7-2425
 7-2499 7-2500 7-2513
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 OAK RIDGE NATIONAL LAB
 Y-12 AREA
 7-2355 7-2356 7-2397
 OAKLEY D C
 7-3175

 OBERLIN COLL
 7-1861
 OBRIEN JOSEPH F
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 OHIO STATE UNIV
 7-2184 7-3106
 OHMART P E
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 7-2370 7-3227
 OKAZAKI A
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 OKLAHOMA AGRICULTURAL
 EXPERIMENT STATION
 7-2488
 OLAFSON JON H
 7-2489
 OLBERT S
 7-2916
 OMEARA F E
 7-2651
 ONEDA S
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 ONEILL L R
 7-2442
 ONEILL T A
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 OOSTERKAMP W J
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 ORCEL JEAN
 7-3085 7-3086
 ORKIN-LECOURTOIS AGNES
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 7-2682
 ORR RAYMOND L
 7-3422 7-3472
 ORR S R
 7-3259
 ORTEL WILLIAM C G
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 OSBORN R K
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 OSBORNE DARRELL W
 7-2330
 OSBORNE L S
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 OSWALT R L
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 OUCHI T
 7-3648

 PAASCHE O G
 7-2569
 PABST H W
 7-2249
 PAGE D I
 7-3487 7-3490
 PAGE L A
 7-2849
 PALAZZI DUCCIO
 7-3313
 PALMER PHYSICAL LAB
 PRINCETON UNIV
 7-2399
 PALTY A E
 7-3103
 PANETTI M
 7-2867
 PANKOVE J I
 7-3133
 PANOFKY H A
 7-2098 7-2099
 PANTCHENKO GREGORY
 7-3009
 PARASOL MATTHEW
 7-2097
 PARK JOHN H
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 PARKER EUGENE N
 7-3416 7-3583

 PARKINSON W C
 7-2659
 PARKS J R
 7-3259
 PARLIN RANSOM B
 7-2338 7-2837
 PARR W H
 7-2724 7-2737
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 PASSAGLIA E
 7-3454
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 PATRIARCA P
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 7-2478 7-2739
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 PAUL E B
 7-2382
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 SCHOOL OF CHEMISTRY
 AND PHYSICS
 7-2761 7-2788
 PENNSYLVANIA STATE COLL
 SCHOOL OF MINERAL
 INDUSTRIES
 7-3432
 PENNSYLVANIA UNIV
 7-2760
 PEKOWITZ L P
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 PEPPARD DONALD F
 7-3397
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 7-1925
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 7-2077
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 PETER BENT BRIGHAM
 HOSPITAL BOSTON
 7-2749

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HOSPITAL MEDICAL
CLINIC BOSTON
7-2748
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7-2704
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7-2377
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7-2387
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7-2082
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7-3233
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7-1890
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7-3019
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7-2273 7-2787 7-2998
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SCHOOL OF MEDICINE
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7-2427
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7-3492
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- POLAROID CORP
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BARBARA HINDERER
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BROOKLYN
7-2270 7-3392
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WALPOLE MASS
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- PORTNOY W M
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7-2085
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7-1987 7-2018
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CHICAGO
7-1862 7-1902 7-1903
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7-3041
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7-2380
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7-2118
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7-1929
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7-2831
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7-2043 7-3474
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7-2497
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7-2737
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7-2333
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7-2878 7-3137 7-3198
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7-1931
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7-3555
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- RADIATION LAB
UNIV OF CALIF BERKELEY
7-1906 7-1957 7-1962
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7-2336 7-2340 7-2364
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7-3304 7-3347 7-3404
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NATIONAL BUREAU OF
STANDARDS
7-2054 7-2055 7-2056
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- RADIOISOTOPE LAB
MONTEFIORE HOSPITAL
NEW YORK
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7-2011 7-3062
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- REDHEAD M L G
7-2342
- REDHEAD P A
7-2848
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7-3477
- REEVES INSTRUMENT CORP
7-3152
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7-2615
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7-2534
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7-1988
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7-2910 7-3214
- RENSSELAER POLYTECHNIC
INST
7-2778 7-2847 7-3037
- RESEARCH FOUNDATION OHIO
STATE UNIV
7-3418
- RESEARCH FOUNDATION
OKLA AGRICULTURAL AND
MECHANICAL COLL
7-1912 7-2840
- RESEARCH LAB OF
ELECTRONICS
MASS INST OF TECH
7-2388 7-2576 7-2590
7-3469
- RESENDE FLAVIO
7-1886
- REY MAURICE M
7-3353 7-3471
- REYNOLDS H J
7-2772
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7-2246
- REYNOLDS S A
7-1926
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ENGINEERING LAB
MASS INST OF TECH
7-2800
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7-2796
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7-2914
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7-3115
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7-3154

RIDDIFORD L
 7-1978
 RIDLEY R W
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 7-3340
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 7-1878
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 7-2117
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 7-2685
 RIPLING E J
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 RISPOLI B
 7-3129
 RITCHIE A C
 7-2950
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 ROAF D
 7-2884
 ROBERTS A
 7-2087
 ROBERTS J D
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 7-2947
 ROBL HERMANN
 7-3243 7-3247
 ROBSON M J
 7-3320
 ROCHESTER UNIV
 7-2087 7-2122 7-2377
 7-3117 7-3173
 ROCK ISLAND ARSENAL LAB
 7-3046
 RODIONOVA L M
 7-3054
 ROESLER F C
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 ROGERS L B
 7-3363 7-3465
 ROLLIER MARIO A
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 7-2876
 ROSE M E
 7-2422 7-2880 7-3573
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 ROSENBERG H
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 ROSENBLUM SALOMON
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 ROSENBLUTH ARIANNA W
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 ROSENTHAL I L
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 ROSKO ANATOL
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 7-1973
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 7-2542
 ROSSEY W G V
 7-3608
 ROSSI B
 7-3465
 ROSTAGNI A
 7-2629
 ROTHSTEIN ASER
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 ROTTA J
 7-2795
 ROUNDS DONALD E
 7-3337
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 7-3185
 ROWLAND FRANK S
 7-3389
 ROWLAND ROBERT E
 7-2728 7-2851
 ROWLINSON J S
 7-3551
 ROYAL AIRCRAFT
 ESTABLISHMENT
 FARNBOROUGH HANTS
 ENGLAND
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 RUBIN L C
 7-2297
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 7-3338
 RUDERMAN M
 7-2924
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 7-3023
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 7-3408
 RUEGER L J
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 RUF FRITZ
 7-2221
 RUGH ROBERTS
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 RUNDLE R E
 7-2506 7-2836 7-3373
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 7-2004
 RUSSELL MARTIN
 7-2554
 RUSSELL PERCY J JR
 7-2487
 RUSSELL R B
 7-2315
 RUST JOHN H
 7-2476
 RUTGERS UNIV
 COLL OF ENGINEERING
 7-3097
 RUTH H JEANETTE
 7-2741
 RUTTER W J
 7-2942 7-3299
 RYAN J W
 7-2765 7-3254
 RYNDERS G
 7-2786
 RYSHKEWITCH EUGENE
 7-1981
 RYTZ A
 7-3487 7-3490
 RZEWUSKI J
 7-2213
 SACHER GEORGE A
 7-2728
 SACHS A
 7-2096
 SACHS DONALD C
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 7-2426 7-3350
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 7-2872
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 7-2291 7-2292 7-3417
 SAHAR A B
 7-3487 7-3490
 SAILOR V L
 7-2121
 ST LOUIS UNIV
 SCHOOL OF MEDICINE
 7-2979 7-3006
 SAKAI MITSUO
 7-2927
 SAKELLARIDIS PAUL
 7-2934 7-2935
 SALECKER H
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 SALISBURY J D
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 SALLER H A
 7-1988 7-2806
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 SALMON P G
 7-3157
 SALOMON K
 7-2982
 SALTER D C
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 SALVETTI C
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 SAMOILOV B N
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 SAMOUKINA I S
 7-3054
 SANCHEZ DEL RIO Y SIERRA
 CARLOS
 7-3612
 SANDERS L G
 7-3224
 SANDERS PHYLLIS
 7-1869 7-1870 7-1900
 7-3324
 SANDERS T M JR
 7-2635
 SANGSTER M
 7-3336
 SANTANA-DIONISIO JOSE
 7-3274
 SARABHAI V
 7-3481
 SARAH MELLON SCAIFE
 RADIATION LAB
 UNIV OF PITTSBURGH
 7-2919 7-3613 7-3614
 SARD R D
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 SARKISOV E S
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 7-3186
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 7-2031
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 GERTRUDE
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 SCHOOL OF AVIATION
 MEDICINE
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- SEDGWICK LABS OF
SANITARY SCIENCE MASS
INST OF TECH
7-3303 7-3325
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FOR CANCER RESEARCH
7-2219 7-2487 7-3295
- 7-3296 7-3297
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YALE UNIV
7-2348
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7-1977
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7-2978
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7-2740 7-2741 7-2742
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7-3444
- SMOTHERS W J
7-2772
- SMYTH R R
7-2363
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7-3446
- SNITZER ELIAS
7-2832
- SOKOLOVA O M
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- SOLID-STATE AND
MOLECULAR THEORY GROUP
MASS INST OF TECH
7-2429 7-3549 7-3550
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7-2898 7-3326
- SOLOWAY SIDNEY
7-1905
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7-2637
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7-1891 7-2954
- SORENSEN S O
7-3544
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7-2654
- SORENSEN C W
7-2798

BOWDEN JOHN C
 7-3199
 SOWERBY M G
 7-3168
 SPAIN PATRICIA
 7-3337
 SPALDING CHARLES K
 7-1891
 SPECTROSCOPY LAB
 ILL INST OF TECH
 7-3401
 SPEDDING F H
 7-2100 7-3034 7-3040
 SPEISER RUDOLPH
 7-2321 7-2350
 SPENCER L V
 7-2675
 SPERRY ALBERT B
 7-2033
 SPIKES JOHN D
 7-3339
 SPIRITES MORRIS A
 7-3343
 SPITZER LYMAN JR
 7-2569
 SPRADLING S
 7-2737
 SPRETNAK JOSEPH W
 7-3418
 SREEKANTAN B V
 7-2379
 STACEY M
 7-1939
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 7-1988
 STAHELIN P
 7-3559
 STANBURY JOHN B
 7-3538
 STANDARD OIL CO OF IND
 7-2797
 STANFORD RESEARCH INST
 7-2953
 STANFORD UNIV
 7-2280 7-3435
 STANG J H
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 STANNARD J N
 7-2982
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 STAPLETON G E
 7-2965 7-2967
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 7-2564
 STAUB HANS H
 7-2939
 STEARNER S PHYLLIS
 7-2727
 STEBBINS
 ALBERT KELLOGG
 7-3219 7-3585
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 7-2489
 STEENBERG N R
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 7-3572
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 STEHLE P
 7-2849
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 7-2096
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 7-2189 7-3277
 STERN T W
 7-3079
 STEYSENKO A I
 7-2277
 STEVENS H M
 7-1951
 STEWART RICHARD
 7-3307
 STIEFF L R
 7-3079 7-3439
 STIRRETT LLOYD A
 7-3345
 STITES J G
 7-3035
 STOBER W
 7-1938
 STOCKELL ANNE
 7-3307
 STODIEK W
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 STOKER P H
 7-3628 7-3633
 STOKES CHARLES S
 7-3020
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 7-2985
 STOLL P
 7-3225 7-3592
 STONE BOBBIE D
 7-2990
 STONE O L
 7-3138
 STORER JOHN B
 7-1870 7-1881 7-1900
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 STOWELL ROBERT E
 7-1858 7-1859 7-1860
 7-1867
 STRAIN HAROLD H
 7-1954 7-3036
 STRANDBERG M W P
 7-2388
 STRANGE E E
 7-3369
 STRASSMANN FRITZ
 7-1954
 STRATTON W R
 7-3597
 STRAUCH KARL
 7-3535 7-3596
 STREET K JR
 7-2986
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 7-2967
 STRICKLAND J D H
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 STRICKLER THOMAS D
 7-2623
 STROD A J
 7-3442
 STROFFOLINI R
 7-2834
 STROMQUIST W K
 7-3412
 STROUD AGNES N
 7-2727
 STROUD C P
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 STRZEMIENSKI K
 7-2234
 STUBBINS WARREN FENTON
 7-3599
 STUGARD F JR
 7-2555
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 7-2576
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 STUTHEIT JAMES S
 7-3258
 SUCCI C
 7-2016
 SUGARMAN NATHAN
 7-2146 7-2714 7-3264
 SUGAWARA MASAO
 7-3655
 SULLIVAN ROBERT L
 7-2467
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 SUMMERS-GILL R G
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 SUMSION H T
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 SUNAKAWA SIGENOBU
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 SURINOV YU A
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 SURYAN G
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 SUSS HENRY
 7-3009
 SUTHERLAND W H
 7-2036
 SUTTLE ANDREW D JR
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 SUTTON DORIS C
 7-3009
 SUTTON R B
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 SUZOR FRANCIS
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 SVEC HARRY J
 7-3349
 SVETLIK E
 7-3351
 SWAKON EDWARD A
 7-2797
 SWAN J B
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 SWAN P
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 SWANN SHERLOCK JR
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 SWANSON DON R
 7-2164
 SWEENEY DURA
 7-2360
 SWORSKI THOMAS J
 7-2522 7-2779
 SYLVANIA ELECTRIC
 PRODUCTS INC
 ATOMIC ENERGY DIV
 7-2308
 SYRACUSE UNIV
 7-2997
 SZAMOSI G
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 TAGLIAFERRI G
 7-2016
 TAHMISIAN THEODORE N
 7-2715
 TAKABAYASI TAKEHIKO
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 TAKAHASHI YASUSHI
 7-3642 7-3647
 TAKEBE HISAO
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 TALBOT JOHN M
 7-3329
 TALBOTT F L
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 TALMAGE DAVID W
 7-2717 7-2952 7-2955
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 7-3364
 TAMURA TARO
 7-3483 7-3610
 TANIFUJI MAKOTO
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 TAO YUNG
 7-1940 7-3384
 TARKANT PAUL
 7-3025
 TATE FRED A
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 TATLOW J C
 7-1937 7-1939
 TAYLOR A E
 7-3206
 TAYLOR C
 7-2076 7-2159
 TAYLOR C BRUCE
 7-1902 7-1903
 TAYLOR DENIS
 7-2365 7-2617
 TAYLOR J
 7-3075
 TAYLOR J H
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 TAYLOR MAYNARD F
 7-3066
 TAYLOR R W
 7-2624
 TAYLOR T I
 7-2272
 TAYLOR W E
 7-2306
 TAYLOR WILLIAM J
 7-3388
 TECHNICAL COOPERATION
 PROGRAM
 7-2273
 TECHNICAL INFORMATION
 SERVICE AEC
 7-2010 7-2819 7-2820
 7-3148
 TECHNICAL OPERATIONS INC
 7-2363
 TEETERS W O
 7-2297
 TEILLAC JEAN
 7-2690
 TELEDDI VALENTINE L
 7-3612
 TELLER AUGUSTA H
 7-2599

- TELLER EDWARD
7-2599
- TEMMER G M
7-2390
- TEMPLE UNIV
7-3402
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7-2336 7-3014
- TENDAM D J
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- TENNENT R M
7-2080 7-3161 7-3493
- TENNESSEE UNIV
7-2731 7-2943 7-3412
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- TEXAS AGRICULTURAL AND
MECHANICAL COLL
RESEARCH FOUNDATION
7-2488
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EXPERIMENT STATION
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7-1918
- THALER R M
7-2863
- THELLUNG A
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- THERMOCHEMICAL LAB
NATIONAL BUREAU OF
STANDARDS
7-2497
- THEUS R
7-2917
- THIBAUD E
7-2482
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- TRIBALAT S
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- TROCHERIS M
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- TROMBE FELIX
7-2424
- TRUCCO RAUL E
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- TRUDEAU FOUNDATION
SARANAC LAKE N Y
7-2747 7-2976
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7-1889
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HERBERT
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7-2277
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7-2102
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7-2716
- UNDERWOOD E E
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- UNIVERSITY OF SOUTHERN
CALIF
7-1915 7-2256 7-2257
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- UPHOFF DELTA
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7-3448
- UTIYAMA RYOYU
7-2206
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- VALADARES MANUEL
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- VANCE JOHN E
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7-2716
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- VERLET LOUP
7-2171
- VERSTER N F
7-3273 7-3278
- VERT ZN L
7-3048
- VICKERS ROLLIN C
7-2559
- VIGNE J
7-2535
- VIGNERON LEOPOLD
7-2618 7-3249
- VILLI C
7-2113
- VINCENT E T
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- VITALE B
7-2017
- VITRO CORP OF AMERICA
7-3410 7-3411
- VIVIEN JEAN
7-1877
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7-2726
- VOGEL MARCUS
7-2733
- VOGEL RICHARD C
7-1936
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7-3039
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7-3518
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- VOLLMER JAMES
7-3390
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7-2159
- VORESS HUGH E
7-2419 7-2820

VOSKO SEYMOUR H
 7-3168

 WACHTER M
 7-3592
 WADEY WALTER G
 7-2623
 WAGNER C
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 WAINER EUGENE
 7-3098
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 WALKER W D
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 WALTON J R
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 WANG S J
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 7-2107 7-3204
 WANIEK R W
 7-2370 7-3227
 WAPSTRA A H
 7-2189 7-3273 7-3277
 7-3278 7-3629
 WARD A H
 7-2075
 WARDLAW W
 7-1919 7-1920 7-1921
 WARFIELD JAMES M
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 WARING CLAUDE L
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 WARNE R J
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 WARNER IRVING
 7-1902
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 7-2177 7-2672
 WARREN SHIELDS
 7-2981
 WASHBURN H W
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 WASHINGTON UNIV SCHOOL
 OF MEDICINE ST LOUIS
 7-3301
 WASHINGTON UNIV ST LOUIS
 7-2753 7-3183
 WASILEWSKI R J
 7-3104
 WATAGHIN V
 7-2152
 WATERBURY GLENN R
 7-2496
 WATERMAN H
 7-2428
 WATERTOWN ARSENAL LAB
 7-2571
 WATKINS G D
 7-2132
 WATSON KENNETH M
 7-2170
 WATSON MICHAEL L
 7-2223 7-2947
 WATSON W W
 7-2822
 WAWZONEK STANLEY
 7-2495
 WEAVER ALBERT B
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 WEAVER BOYD
 7-2597

 WEAVER C E
 7-2299
 WEAVER C V
 7-2996
 WEAVER H E JR
 7-2649
 WEBSTER T C
 7-2743
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 7-2034 7-2653
 WEINBERG IZABELLA GOLDIN
 7-2112
 WEINHOUSE SIDNEY
 7-3343 7-3402
 WEINSTOCK BERNARD
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 WEISNER E
 7-3214
 WEISSKOPF VICTOR F
 7-3223 7-3558 7-3560
 WEISSMAN S I
 7-3199
 WEISSMANN SIGMUND
 7-3097
 WELLCOME RESEARCH LABS
 7-2219
 WELLS-COLE J
 7-1910
 WELLS F H
 7-2038
 WELSH J H
 7-1905
 WELTON T A
 7-2385
 WENT J J
 7-2069
 WENTZEL G
 7-2208
 WERKING L C
 7-1941
 WERLE J
 7-2110
 WERNHOLM O
 7-2162
 WERZ R
 7-3528
 WESLEY R P
 7-2029
 WESSEL GUNTER
 7-3202
 WEST D
 7-2380 7-2906
 WEST J M
 7-2437
 WEST R
 7-2039
 WEST WALTER S
 7-1982 7-3083 7-3440
 WESTIN BJORN
 7-2252
 WESTMAN AXEL
 7-2231
 WESTRUM EDGAR F JR
 7-3347
 WEXLER S
 7-2117 7-2876
 WHEATCROFT M G
 7-2972
 WHEELER GEORGE W
 7-2822
 WHEELER H E
 7-2722
 WHEELER JOHN ARCHIBALD
 7-2705
 WHEELWRIGHT E J
 7-3040
 WHELER GORDON A JR
 7-3325
 WHITAKER ROY A
 7-3049
 WHITE DAVID
 7-3379
 WHITE G D
 7-3076
 WHITE GEORGE R
 7-3541
 WHITE M G
 7-1962 7-3084
 WHITING F B
 7-2040
 WIBERG EGON
 7-3352
 WIERLEY STEPHEN E
 7-3365
 WICK ARNE N
 7-2462
 WIDEROE R
 7-2973

 WIESNER J B
 7-2590
 WIJSMAN ROBERT ARTHUR
 7-2225
 WILDE KENNETH A
 7-2338 7-2837
 WILHELM H A
 7-3661 7-3662 7-3663
 WILKERSON MARY CATLETT
 7-3307
 WILKINS J ERNEST JR
 7-2675
 WILKINSON D H
 7-2155
 WILKINSON M K
 7-3131
 WILKINSON PAUL N
 7-1863
 WILKINSON R G
 7-2573
 WILLARD H B
 7-2126
 WILLARD JOHN E
 7-1913
 WILLIAMS D L
 7-2992
 WILLIAMS DUDLEY
 7-2128
 WILLIAMS MARY CARR
 7-3344
 WILLIAMS R W
 7-3465
 WILLIAMS ROBERT E
 7-1912
 WILLIAMSON C W
 7-2647
 WILLIAMSON E M
 7-2104
 WILLIAMSON J K
 7-2081 7-2376
 WILMARTH W K
 7-2256 7-2257 7-2258
 WILMOT R D
 7-1984
 WILSDORF HEINZ
 7-1998
 WILSON ELIZABETH E
 7-2120
 WILSON JAMES G
 7-2463 7-3322
 WILSON MARGARET E
 7-1858 7-1859 7-1860
 7-1867
 WILSON V C
 7-2452
 WILSON W B
 7-3095
 WILTS JAMES R
 7-2059 7-2608
 WINGO W J
 7-2457
 WINSLOW G H
 7-2183 7-2698
 WINTERSTEIGER V
 7-3532
 WINTHER AAGE
 7-2192 7-3622
 WIRTH H
 7-2638
 WISCONSIN UNIV
 7-1913 7-2319 7-2872
 7-2875 7-2893 7-2894
 7-2895 7-3340
 WISCONSIN UNIV
 MEDICAL SCHOOL
 7-2743 7-2744
 WISSLER R W
 7-3320
 WITHERSPOON R R
 7-2759
 WITTELS M
 7-2180
 WITTEN VICTOR H
 7-2243 7-3318
 WITTENBORG M H
 7-2228
 WITTWER S H
 7-3342
 WOLFE R A
 7-2940
 WOLFENSTEIN L
 7-2639 7-3189
 WOLLAN E O
 7-3237
 WOOD A J
 7-3358
 WOOD D E
 7-3155
 WOOD D S
 7-2813
 WOOD E
 7-3206
 WOOD J SUMNER JR
 7-1864 7-2218

WOOD R G
7-2036
WOODCOCK CLARENCE C
7-2736
WORMAN F C V
7-1869
WRENSHALL GERALD A
7-2984
WRIGHT BYRON T
7-3262
WRIGHT G T
7-2037
WRIGHT H D
7-2299 7-3432
WRIGHT K H R
7-3631
WRIGHT ROBERT J
7-3445
WU C S
7-3282
WYARD S J
7-3604
WYCKOFF H O
7-2680
WYCKOFF PETER H
7-2357
WYCKOFF RALPH W G
7-3315
WYLY L D
7-2150

YADAV H N
7-2341
YAFFE L
7-2391
YALE UNIV
7-2762 7-2822
YAMADA MASAMI
7-3565 7-3567
YAMAGUCHI YOSHIO
7-2102

YAMAMOTO T
7-3651
YANG C T
7-3450
YANOFSKY CHARLES
7-3321
YARNELL Y L
7-3597
YASAITIS E L
7-2856
YATES PAUL C
7-1912
YEAGER ERNEST
7-2759
VOCCOZ JEAN
7-2402
YOKOYAMA HISAKO O
7-1858 7-1859 7-1860
YOLI A H
7-2300
YONTS O C
7-3501
YORK C M
7-3178
YOSHIDA SHIRO
7-3610
YOUNG A P
7-3095
YOUNG C T
7-1991
YOUNG G A
7-3381
YOUNG J C
7-3305
YOUNG JOHN A
7-3025
YOUNG R A
7-3356
YUAN LUKE C L
7-3511
YUASA TOSIKO
7-2699

YUDOWITCH K L
7-3361
YUHL ERIC T
7-3345

ZACHARIAS J R
7-3465
ZAKHAROVA V P
7-3116
ZALESKI P
7-3169 7-3248
ZATSEPIN G T
7-3118
ZAVERINA E D
7-3400
ZEID MAHMOUD M I
7-1904
ZELDES NISSAN
7-3576 7-3638
ZELIKOFF MURRAY
7-2357
ZERNOW L
7-3502
ZHUKHOVITSKII E M
7-2286
ZIEGLER W T
7-3356
ZIELEN A J
7-2828
ZILBERMAN A E
7-2344
ZIMMER E L
7-2086
ZIMMERMANN H J
7-2590
ZOLINGER J J VAN
7-2069
ZUCKER A
7-2150
ZUCKER E R
7-2190
ZWOLINSKI BRUNO J
7-2338 7-2837

SUBJECT INDEX

The bold face number followed by a colon is the volume number, and the numbers following are the abstract numbers. The designation (R) following an abstract number indicates that it is an abstract of a progress report; the designation (J) indicates that it is an abstract of a journal (published literature) article; and the designation (P) indicates that it is an abstract of a patent. Abstract numbers for reports other than progress reports carry no letter designations.

A

- Abdomen**
effects of covering with thin lead foil during irradiation, on mortality of rats, **7: 2729(R)**
- Absorption**
(See also appropriate subheadings under materials absorbed and absorbents.)
during intense mixing, kinetics of, **7: 3047**
- Abundance**
(See appropriate subheadings under specific metals, minerals, ores, etc.)
- Accelerator conferences**
at Brookhaven National Lab., Dec. 16 and 17, 1952, notes on, **7: 2410**
- Accelerator tubes**
electric performance of Van de Graaf tubes, **7: 2322**
initial performance and deterioration during operation, **7: 2413(J)**
ion optics in long high-voltage, **7: 2665(J)**
- Accelerators**
(See also Betatrions; Bevatron; Brookhaven synchrotron; Calutrions; Cockcroft-Walton Accelerators; Cyclotrons; Linear accelerators; Synchrocyclotrons; Synchrotrons; Van de Graaff accelerators.)
design dimensions of various proposed high-energy, **7: 2890**
synchronization of pulsed high-energy ion beams, **7: 2159(J)**
- Acetates**
metabolism in liver slices of hyperthyroid rats, **7: 3343**
- Acetic acid**
radiation chemistry, **7: 2957(R)**
- Acetic acid, allyl esters**
polymerization of deuterated, **7: 3016(J)**
- Acetic acid, amino-**
(See Glycine.)
- Acetic acid, chloro-**
nuclear quadrupole resonance, **7: 2647(J)**
- Acetic acid, (ethylenediamine)tetra-**
effects on isolated mammalian heart, **7: 2944**
as reagent in precipitation separation of rare earths, **7: 1953(J)**
- Acetic acid, (ethylenediamine)tetra-, calcium salts**
in therapy of heavy-metal poisoning, **7: 2485(J)**
in therapy of Pb poisoning, case histories and dosage schedule, **7: 2245**
in therapy of Pu poisoning, **7: 2957(R)**
- Acetic acid, (ethylenediamine)tetra-, sodium salts**
in therapy of Pu poisoning, **7: 2957(R)**
- Acetic acid, (ethylenedinitrilo)tetra-**
(See Acetic acid, (ethylenediamine)tetra-.)
- Acetic acid, mercapto-**
radiosensitivity effects on protein coagulation, **7: 3314(J)**
- Acetic acid, mercapto-, sodium salts**
radiosensitivity effects on protein coagulation, **7: 3314(J)**
- Acetone, acetyl-**
(See 2,4-Pentanedione.)
- Acetone, thenoyltrifluoro-**
polarographic behavior, complexation with borates, and determination of, **7: 2501**
in solvent extraction of Ni, **7: 2498(R)**
- Acetylacetone**
(See 2,4-Pentanedione.)
- Acriflavine**
effects on mitoses in vegetative root tips, **7: 1886(J)**
- Actinides**
(Type 5f rare earths; see also the specific elements; see also Rare earths.)
bonding in 5f orbitals, ion exchange study of, **7: 2986**
inclusion of Th, Pa, and U as, **7: 3004(J)**
- Actinium**
electrochromatographic separation, **7: 1955(J)**
separation from mixture of Ac and Ra or Ac and Th, **7: 2440(P)**
- Actinium isotopes Ac^{227}**
nuclear energy levels, **7: 2685(J)**
thermal neutron capture cross sections, **7: 2009(R)**
- Activation analysis**
(See Radiometric analysis.)
- Activated carbon**
(See Carbon (activated).)
- Adenine**
incorporation into nucleotides and nucleic acids, in mice, **7: 1957**
metabolic effects on diaminopurine-resistant bacteria, **7: 2219**
synthesis of tritium-labeled, **7: 3296(R)**
synthesis of tritium- or deuterium-labeled, **7: 3406(J)**
- Adenosine phosphoric acids**
metabolism by E. coli, effects of radiation on, **7: 2967(J)**
- Adenylic acid**
(See Adenosinephosphoric acids.)
- Adenylpyrophosphoric acid**
(See Adenosinephosphoric acids.)
- Adrenal glands**
effects of hypophysectomy, demedullation, and epinephrine injection on ascorbic acid content and in vitro O consumption of, **7: 1864**
effects of removal on phosphatase activity in irradiated rats, **7: 3313(J)**
function in alloxan-diabetic rabbits, **7: 2218**
- Adsorbed films**
(See also Films.)
radioactive trace elements in studies of thin, **7: 2938**
- Aerial surveying**
of Devils Tower Area, Crook Co., Wyo., **7: 2802**
- Aerosols**
(See also Powders.)
aging, effect of electric charge distribution on coagulation and surface loss during, **7: 3005**
collection and sampling by thermal precipitation, **7: 2261**
electrification, production, and particle size measurement, **7: 2011**
filtration, **7: 2542(R)**
filtration, role of particle diffusion and interception in, **7: 3062**
production, **7: 3327(R)**
- Aggregates**
(See Concrete aggregates.)
- Agriculture**
tracer techniques in, merits of, **7: 3342**
- Air**
(See also Atmosphere; Gases; Meteorology.)
charge states of He beam in, **7: 2832(J)**
luminescence in α -irradiated, **7: 2419(J)**
purification, methods for, **7: 2542(R)**
- Air Cleaning Lab., Harvard Univ. School of Public Health**
progress reports on air cleaning, **7: 2542(R)**
- Air Force Radiation Lab., Univ. of Chicago**
progress reports, **7: 2729(R)**
- Alanine, β -mercapto-**
(See Cysteine.)
- Alanine, phenyl-**
synthesis of N^{14} -labeled, **7: 3052**
- Alaska**
prospecting for radioactive deposits in, **7: 3083, 3084**
prospecting for radioactive deposits in Seward Peninsula, **7: 1982**
prospecting for Th and U in, **7: 2801**
radioactivity investigations of Serpentine-Kougarok Area, Seward Peninsula, **7: 3440**

- Albumins**
effects of radiation on physicochemical properties of, 7: 1876(J)
radiosterilization, 7: 2940(R)
- Alcohols**
(See also specific alcohols, e.g., Ethanol.)
fluorinated, acidity and infrared absorption spectra, 7: 3024(J)
- Alfred Univ.**
progress reports on graphitization of C, 7: 1940(R), 3384(R)
- Algae**
effects of light and metabolic factors on Na and K distribution in Ulva lactuca, 7: 1861
- Alkali metal fluoride complexes**
with metals of the third group, preparation of, 7: 3381
- Alkali metal halide crystals**
x-ray-induced F bands in mixed, 7: 2421(J)
- Alkaline earth metals**
selective transmission by placental tissue, 7: 1863
- Alkaline earth titanates**
physical and chemical properties, survey of, 7: 3108
- Alkyl bromides**
epithermal reactions of recoil atoms in, 7: 3389
- Alkyl halides**
radiation chemistry, 7: 3392(R)
- Alloys**
(See also specific alloys indexed by constituents; see also Metals.)
thermal conductivity and effects of low temperatures on physical properties of, 7: 2549
- Alpha decay**
correction to period-energy relation in, for electron train, 7: 2692(J)
fine structure intensity in even-even nuclides, 7: 2690(J)
ionization of K or L shells of atoms from, probability, 7: 3272(J)
one-body models of, 7: 2183, 2698
periodicities in intervals between Po α emission, 7: 2195(J)
theory and formula development for, 7: 2383
theory for case of non-zero azimuthal quantum numbers, 7: 3276(J)
- Alpha particles**
(See also appropriate subheadings under specific isotopes and materials.)
absorption of π^- mesons by, theory, 7: 2377
cross sections for formation of compound nuclei by, 7: 3557(J)
detection and measurement, design of thin nylon-foil windows for counting chambers, 7: 3679(P)
detection and measurement, evaluation of instruments for, 7: 2854
detection and measurement, pulse type radiation detection instrument for, 7: 3518
detection and measurement with nuclear emulsions, 7: 2375(J)
detection of α -labeled substances in tissue sections with fluorescent chemicals, 7: 2459(J), 2460(J)
effects on fluorescence of organic phosphors, CdWO₄, and ZnS, 7: 3615(J)
from injected At²¹¹, effects on thyroid gland, 7: 2957(R)
ionization by, in noble gases and noble-gas mixtures, 7: 2052(R)
luminescence induced by, in air, glass, and quartz, 7: 2419(J)
from Ra²²⁴, effects on human skin, 7: 3318(J)
range-energy relation of, in nuclear emulsions, 7: 2621(J), 2673(J),
range-energy relation of 10- to 250-kev, in gases, 7: 3234
- Alpha sources**
radioautography of weak, with spark counter, 7: 2063(J)
- Alumina**
(See Aluminum oxides.)
- Aluminum**
absorption of soft component of cosmic radiation in, 7: 3120(J)
alpha reactions, analysis of secondary particles from, 7: 2656
colorimetric determination of traces of, in presence of colored ions, 7: 3355
creep, crystal fragmentation during, 7: 2314(J)
creep, grain-boundary slip during, 7: 2313(J)
creep rates of, effect of stress on, 7: 2812
crystal structure, 7: 3097
deformation by repeated shocks of annealed polycrystalline, 7: 3105(J)
determination in Zr by ion exchange, 7: 3367(J)
dynamic stress-strain relations for annealed 2S, under compression impact, 7: 2813
electron and positron absorption in, 7: 2909(J)
electron-diffraction intensity curve for, 7: 2371(J)
fluorimetric determination with 8-quinolinol, 7: 3365(J)
gamma backscattering from, 7: 2896
gamma reactions (γ, p), 7: 3221
joining of, review of methods for, 7: 2311(J)
mean excitation potential for protons in, 7: 2914(J)
- Aluminum (Cont'd)**
neutron reactions (n, γ), cross sections for, 7: 2655
neutron production by cosmic rays in, at 0 to 54° latitude and 30,000 ft pressure altitude, 7: 3123(J)
neutron total cross sections, 7: 2123(J), 2871(J), 3206(J)
pair production cross section at 1.33 and 2.62 Mev, 7: 2130(J)
penetrating cosmic showers under, rates of occurrence, 7: 3122(J)
photon reactions (γ, p), 7: 2318(R)
pitting corrosion, mechanism of, 7: 2298(J)
plastic deformation, surface structure and slip-band development in, 7: 1998(J)
plastic properties, 7: 2564
preparation, by electrolysis of Al(NO₃)₃ or Al₂(SO₄)₃ solutions, 7: 3462
proton reactions (p, n), energy distribution of neutrons from, 7: 3596(J)
radiation absorption, half-value layer, 7: 2898
radiation damage, x-ray-diffraction methods for evaluating, 7: 2177(R)
soldering to metal plates, technique for, 7: 3463(J)
welds, vacuum tightness of, 7: 2004(J)
x-ray spectra, 7: 2319
- Aluminum alloys**
creep and stress-rupture of, 7: 2811
creep rates of, effect of stress on, 7: 2812
creep-rupture tests of, at 300°F in air, 7: 1988
joining of, review of methods for, 7: 2311(J)
weldments, strength tests, 7: 2572(J)
x-ray spectra, 7: 2933(R)
Young's modulus, Poisson's ratio, and rigidity modulus of, 7: 3455
- Aluminum-chromium-nickel-titanium alloys**
aging characteristics, 7: 2567(R)
- Aluminum-chromium-titanium alloys**
constitution diagrams and mechanical properties, 7: 3458
- Aluminum-copper alloys**
creep properties, effect of dispersions of CuAl₂ on, 7: 1992
fatigue properties at room temperature, effect of CuAl₂ dispersions on, 7: 3096
plastic properties, 7: 2564
stress corrosion in, 7: 3426
structural changes during aging, 7: 2310(J)
- Aluminum-copper crystals**
plastic deformation by repeated shocks, 7: 1999(J)
- Aluminum-copper-magnesium alloys**
recovery in artificially aged, 7: 2309(J)
structural changes during aging, 7: 2310(J)
- Aluminum-copper-zinc alloys**
plastic properties, 7: 2564
- Aluminum crystals**
orientations in, method for determining, 7: 2002(J)
plastic deformation, 7: 3095
- Aluminum-iron-titanium alloys**
mechanical properties and phase studies, 7: 3459(R)
- Aluminum isotopes Al²⁶**
decay schemes, 7: 2141(J)
- Aluminum isotopes Al²⁷**
alpha reactions ($\alpha, 2pn$), cross section from threshold to 380 Mev, 7: 3586
decay schemes, 7: 2141(J)
deuteron reactions (d, p), angular distributions, 7: 2907(J)
mass difference of Si²⁷ and, from Al²⁷(p, n)Si²⁷ threshold, 7: 2126(J)
nuclear electric quadrupole moment recalculation, from hyperfine structure interval measurement of 3p²P_{1/2} state, 7: 3202(J)
proton reactions (p, γ), 7: 2141(J)
proton reactions (p, γ), resonant energies for, 7: 2889(J)
proton reactions (p, n), threshold for, 7: 2009(R)
- Aluminum-lithium alloys**
soldering to metal plates, technique for, 7: 3463(J)
- Aluminum-lithium-magnesium alloys**
analysis for Li with a flame photometer, 7: 3369(J)
- Aluminum-magnesium alloys**
weldments, strength tests, 7: 2572(J)
- Aluminum-magnesium-zinc alloys**
effects of cold work on microstructure and corrosion resistance, 7: 2001(J)
- Aluminum-manganese-titanium alloys**
mechanical properties and thermal expansion, 7: 3418
- Aluminum-molybdenum-titanium alloys**
constitution diagrams and mechanical properties, 7: 3458
- Aluminum nitrates**
electrolysis of, for preparation of Al, 7: 3462
- Aluminum oxide crucibles**
properties and fabrication, 7: 3076

- Aluminum oxide crystals
saturation in x-ray coloration of, 7: 2181(J)
- Aluminum oxides
compression strength of porous sintered, 7: 1981(J)
recrystallization, effects of Ti_2O_3 and Sb_2O_5 on, 7: 2772(R)
thermal conductivity, 7: 3100(R)
- Aluminum silicate crucibles
properties and fabrication, 7: 3076
- Aluminum silicates
thermal ion emission, 7: 3505(J)
- Aluminum-silicon systems
effects of radiation on electric conductivity and hardness of, 7: 2306
- Aluminum sulfates
electrolysis of, for preparation of Al, 7: 3462
- Aluminum-tantalum-titanium alloys
constitution diagrams and mechanical properties, 7: 3458
- Aluminum-titanium alloys
constitution diagrams and mechanical properties, 7: 3458
- Aluminum-titanium-vanadium alloys
mechanical properties and phase studies, 7: 3459(R)
- Aluminum-zinc alloys
clustering in, measurement of, 7: 2671
diffuse x-ray scattering, interpretation from powder patterns of, 7: 2670
effects of Cu additions on plastic properties of, 7: 2564
magnetic susceptibility of, 7: 3454(R)
- Aluminum-zirconium alloys
tensile properties of, up to 300°C, 7: 3457(R)
- Alundum
(See Aluminum oxides.)
- Americium chlorides
hydrolysis, thermodynamic constants of, 7: 1962
- Americium isotopes Am^{241}
gamma radiation from, following α decay, 7: 2686(J)
as gamma source in industry, medicine, and research, 7: 2039(J)
- Ames Lab.
progress reports on physics, 7: 2318(R)
- Amine complexes
aquation kinetics of Co(III) diamine complexes, 7: 2754
- Amino acids
in antibody synthesis, tracer techniques, 7: 2980
non-enzymatic-transamination with glyoxylic acid and, 7: 3402
- Ammonia
catalytic decomposition over Cu, 7: 2760(R)
dissociation of, mass spectrometric measurement, 7: 2609
microwave absorption spectrum of ND_3 , 7: 2634(J)
photosynthesis of, 7: 3393
- Ammonium bromides
crystal structure in four phases, neutron-diffraction determination of, 7: 3374(J)
neutron-diffraction study of NaCl-type modification in deuterated, 7: 2511(J)
- Ammonium chlorides
neutron-diffraction study of NaCl-type modification in deuterated, 7: 2511(J)
- Ammonium hydroxides
lattice constants at -100°C, 7: 2336
- Ammonium oxides
crystal structure at -100°C, 7: 2336
- Ammonium zirconium fluorides
preparation and properties, 7: 3380(R)
- Ampelites
(See Shales.)
- Amplifiers
(See also Electron tubes.)
circuit for automatically determining current-voltage characteristics of an electrical device, 7: 2447(P)
- Analogs
(See main headings and subheadings for the characteristics being measured, e.g., Electric conductivity; see Circuits; Computers.)
- Analyzers
(See Computers; Oscillographs; Pulse analyzers; Spectrometers.)
- Anemia
induced by Po, tracer techniques for studying, 7: 2982
radioinduced, pathogenesis of, 7: 2473(J)
- Aniline
corrosive effects on Ti, Zr, and stainless steel, 7: 3427(J)
- Animal care
(See also Metabolism cages.)
construction of experimental animal quarters at Argonne National Lab., 7: 2216
- Animal cells
Golgi bodies and mitochondria in, phase-contrast and electron microscope studies of, 7: 2715
mass, measurement of, 7: 3296(R)
mass, quantitative autoradiographic technique for, 7: 2744
tyrosinase activity determination in human pigment cells and pigment-cell neoplasms with labeled tyrosine, 7: 2971(R)
- Animal metabolism
effects of enzyme systems on, 7: 2728(R)
effects of radiation on acetylation of p-aminobenzoic acid in, 7: 2728(R)
effects of radiation on blood and intestinal Ca ratio in, 7: 2728(R)
- Anoxia
effects on radiosensitivity of mice, 7: 3324
- Anthracene
effects of electron irradiation on fluorescence of, 7: 3615(J)
- Antibiotic therapy
effects on survival following irradiation, in mice, 7: 2741(J), 2742(J)
- Antibiotics
(See also specific antibiotics.)
effects of radiation on, 7: 2940(R)
effects on plant metabolism, 7: 1906
- Antibodies
biosynthesis of, tracer techniques for studying, 7: 2980
effects of radiation on, 7: 2940(R), 3319(J)
effects of radiation on formation of, 7: 2952, 2955, 3320(J)
effects of whole-body irradiation on response of mice to, 7: 2224
preparation of antitissue, 7: 3297(R)
response to emulsified protein antigens, 7: 2717
- Antigens
preparation and retention of emulsified soluble protein, 7: 2717
- Antimony
thermodynamic properties, 7: 3456(R)
- Antimony isotopes
nuclear quadrupole resonant lines of, in $SbCl_3$, 7: 2320(R)
- Antimony isotopes Sb^{124}
beta-gamma angular correlation, effect of coulomb field on, 7: 3567(J)
decay schemes, coincidence studies with scintillation spectrometers, 7: 2374(J)
internal conversion, K/L + M ratios, 7: 2694(J)
- Antimony-tin alloys
superconductivity of, magnetic studies, 7: 3454(R)
- Applied Research Labs., Glendale, Calif.
progress reports on spectrographic analysis of raw and process materials, 7: 2933(R)
- Applied Science Research Lab., Univ. of Cincinnati
progress reports on study of porous media by flow methods, 7: 1973(R)
- Arabinose
synthesis of C^{14} -labeled, 7: 2767
- Arcs
(See Electric arcs.)
- Argon
charge states of He beam in, 7: 2832(J)
energy loss distribution of 1.3-Mev electrons in, 7: 2906(J)
quenching of photons in proportional counters filled with, 7: 3533(J)
specific primary ionization by high-energy electrons, 7: 2638(R)
- Argon isotopes A^{36}
suitability of, for β - ν correlation measurement of the Fermi term, 7: 2642(J)
- Argon isotopes A^{37}
K capture in, energy distribution of bremsstrahlung following, 7: 2922
- Argonne National Lab.
progress reports on biological and medical research, 7: 2725(R)
progress reports on instrument research and development, 7: 2052(R)
progress reports on physics, 7: 3107(R)
- Arizona
geophysical exploration, 7: 3431
- Armour Research Foundation
progress reports on improving Ti-Al binary alloys by addition of a third component, 7: 3459(R)
progress reports on refractories suitable for melting Ti and its alloys, 7: 3425
progress reports on surface hardening of Ti with metalloid elements, 7: 2565(R)
- Aromatic compounds
base strengths and conductances in anhydrous HF, 7: 3022(J)
- Arsenic
x-ray spectra, 7: 2319
- Arsenic isotopes As^{70}
half life and radiations from, 7: 2187(J)

- Arsenic isotopes As⁷¹**
 beta spectrum, **7: 3633(J)**
 beta spectrum, Auger lines in, **7: 3628(J)**
- Arsenic isotopes As⁷⁵**
 gyromagnetic ratios and nuclear magnetic moments, **7: 2128(J)**
 nuclear magnetic moments, **7: 2649(J)**
- Arsenic isotopes As⁷⁷**
 fission yields, **7: 2146(J)**
- Arsenic isotopes As⁷⁸**
 fission yields, **7: 2146(J)**
- Ascorbic acid**
 radiosensitivity effects on protein coagulation, **7: 3314(J)**
- Asparaginic acid**
 (See **Aspartic acid**.)
- Aspartic acid (Aminosuccinic acid)**
 synthesis and purification of C¹⁴-labeled, **7: 2533**
- Asphaltic deposits**
 (See **Carbon-uranium sandstone deposits**.)
- Asphaltites**
 uranium occurrence in, form of, **7: 3433(R)**
- Astatine**
 accumulation, metabolism, and biological effects on rats and monkeys, **7: 2720(J)**
 pathological effects on thyroid gland, **7: 2957(R)**
- Atmosphere**
 (See also **Air**; **Meteorology**.)
 small-scale turbulence, photographic techniques for study of, **7: 3546(R)**
 turbulence, **7: 3183(R)**
- Atomic Energy Commission**
 outline of declassified volumes in the National Nuclear Energy Series, **7: 2010**
- Atomic Energy Project, Univ. of Rochester**
 index of reports and publications, **7: 2220**
 progress reports on biology, **7: 2960(R)**
- Atomic Energy Project, Western Reserve Univ.**
 progress reports on biological and medical research, **7: 2730(R)**
- Atomic structure**
 (See also as subheading under specific elements.)
 energy levels studied by generalized self-consistent field method, **7: 2429(R)**
 sequence of completion of electron levels, **7: 2260(J)**
 statistical theory of electron-shell configurations and periodic system, **7: 3013(J)**
 theory, **7: 3550(R)**
 theory of electronic, **7: 3549**
- Atoms**
 electron energy levels, **7: 3550(R)**
- ATP (adenosine triphosphate)**
 (See **Adenosinephosphoric acids**.)
- Autoradiography**
 (See **Radioautography**.)
- Autotitrator**
 (See **Titration equipment**.)
- 8-Azaadenine**
 metabolic effects on diaminopurine-resistant bacteria, **7: 2219**
- Azeotropes**
 separation by diffusion through glass, **7: 2524(R)**
- Azine**
 (See **Pyridines**.)
- B**
- Babcock and Wilcox Co.**
 progress reports on corrosion and erosion of liquid metal systems, **7: 2809(R)**
- Bacteremia**
 in mice injected with *E. coli* and *S. enteritidis*, effects of x irradiation on, **7: 3301**
- Bacteria**
 (See also by species.)
 metabolism of carbohydrates by *L. bulgaricus* strain Gere A, **7: 3299**
 metabolism of glucose by *L. bulgaricus*, **7: 2942**
 metabolism of nitrate by *Pseudomonas*, **7: 2488**
 radiosensitivity, effects of cysteine on, **7: 2475(J)**
- Bacteriophages**
 development in *E. coli*, effects of x radiation on, **7: 3315(J)**
- Baddelyites**
 hafnium/Zr abundance ratio and specific radioactivities, **7: 3443(J)**
- Balances**
 magnetic weighing and gas-density, design, **7: 2596(J)**
- Barite concretes**
 physical properties, **7: 2425**
- Barium**
 separation from Ra by chromate fractionation procedure, **7: 3035**
- Barium isotopes Ba¹³³**
 half life of 11.7-kev excited state, **7: 2691(J)**
- Barium isotopes Ba¹³⁴**
 energy levels from β decay of Cs¹³⁴, **7: 3632(J)**
- Barium isotopes Ba¹³⁷**
 K Auger electron yields of, from Cs¹³⁷, **7: 2186(J)**
- Barium isotopes Ba¹³⁹**
 neutron activation cross sections, **7: 2116**
- Barium isotopes Ba¹⁴⁰**
 internal conversion, K/L + M ratios, **7: 2694(J)**
- Barium sulfates**
 adsorption of lauric acid by, **7: 2800(R)**
 preparation of chloride-free, **7: 2800(R)**
- Barium titanates**
 x-ray spectra, **7: 2933**
- Barometers**
 unit for radiosondes, **7: 2593(J)**
- Bartol Research Foundation, Franklin Inst.**
 progress reports, **7: 2638(R)**
- Barytes**
 (See **Barium sulfates**.)
- Battelle Memorial Inst.**
 progress reports on the production of sound ductile joints in Mo, **7: 3449(R)**
 progress reports on welding of beta-stabilized Ti alloys, **7: 3447(R)**
- Batteries**
 (See **Storage batteries**.)
- Beams**
 (See main headings for beams identified by particles; e.g., **Ion beams**; **Neutron beams**.)
- Bearings**
 (See also **Journal bearings**.)
 fluid, properties, performance, and applications of, **7: 2791**
 for high-speed rotating-mirror frame camera, **7: 2347**
 lubrication at -65° to +450°F, development and evaluation of grease for, **7: 2797(R)**
- Benzene**
 base strengths and conductances of methyl-substituted, in anhydrous HF, **7: 3022(J)**
 effects of γ rays on aqueous solutions of, **7: 2779(J)**
 Friedel-Crafts reactions with ethyl chloride on AlCl₃, **7: 1913**
 nuclear magnetic resonance of trideuterated, **7: 3579(J)**
 oxidation, effects of radiation on rate of, **7: 3393**
 permeation through glass, **7: 2524(R)**
 synthesis of C¹⁴-labeled, **7: 3056(J)**
- Benzene, chloro-**
 diffusion coefficients of CS₂ and, as function of pressure, **7: 2987**
- Benzene, p-dichloro-**
 nuclear quadrupole resonance in, **7: 2648(J)**
- Benzene, methyl-**
 (See **Toluene**.)
- Benzene, nitro-**
 substitution reactions with neutron-activated Br⁸², **7: 2519(J)**
- Benzoic acid**
 radiometric determination of C¹⁴-labeled, with vibrating-reed electrometer, **7: 1931(J)**
 synthesis of C¹⁴-labeled, for efficiency determination in scintillation counting, **7: 2992**
- Benzoic acid, ethyl ester**
 substitution reactions with neutron-activated Br⁸², **7: 2519(J)**
- Benzoic acid, methyl ester**
 substitution reactions with neutron-activated Br⁸², **7: 2519(J)**
- 3,4-Benzopyrene**
 effects of prolonged radiation on, **7: 1950(J)**
- Benzoxazoles**
 as volumetric reagent for Cd, **7: 3010**
- Beryllium**
 activities produced in, by N⁺³ ion bombardment, **7: 2150(J)**
 alpha reactions, analysis of secondary particles from, **7: 2656**
 biochemical effects, **7: 2747(R)**
 corrosion by liquid Pb at 1000°C, **7: 2312(J)**
 determination of μ g amounts using 2,4-pentanedione, **7: 3359**
 electron scattering cross sections at 6.1 Mev, **7: 2677(J)**
 fluorimetric determination, **7: 2747(R)**
 helium ion (He³) reactions with, activities produced by, **7: 2887(J)**
 high-temperature reactions, **7: 2588**
 neutron reactions, mesons produced by, **7: 2578(R)**

Beryllium (Cont'd)

- neutron total cross sections, in 3- to 12-Mev region, 7: 2123(J)
- pair production cross section at 2.62 Mev, 7: 2130(J)
- proton reactions (p,n), energy distribution of neutrons from, 7: 2142(J), 3596(J)
- retention and pathological effects of inhaled, in rats and guinea pigs, 7: 2976
- soldering to metal plates, technique for, 7: 3463(J)
- thermal properties and determination of cooling-hole distribution for reactor reflectors of, 7: 3213
- Beryllium complexes**
 - with tropolone, chemical stability, 7: 2788
- Beryllium-copper alloys**
 - crystal structure, 7: 3097
 - effects of radiation on electric conductivity and hardness of, 7: 2306
- Beryllium fluorides**
 - production by reaction of $\text{Be}(\text{OH})_2$ and HF, 7: 3662(P)
- Beryllium hydrides**
 - preparation and properties, 7: 3352
- Beryllium hydroxides**
 - reaction with HF to produce Be fluoride, 7: 3662(P)
- Beryllium isotopes Be^7**
 - decay constants of, comparison in Be, BeO, and BeF_2 , 7: 2120
- Beryllium isotopes Be^8**
 - energy levels, 7: 2088
 - energy levels, from $\text{Be}^{10}(\text{d},\alpha)$ reactions, 7: 3587(J)
- Beryllium isotopes Be^9**
 - alpha reactions ($\alpha, n\gamma$), 7: 3590(J)
 - deuteron reactions (d,p) and (d,t), angular distributions at 1.3 Mev, 7: 2857(J)
 - gamma reactions (γ, n), cross section and angular distribution from 20 to 200 Mev, 7: 2888(J)
 - gamma reactions (γ, p), cross section, 7: 2404(J)
 - neutron reactions (n, p^-), angular distributions, 7: 2628
 - photodisintegration cross section at 2.185 Mev, 7: 2877
- Beryllium-nickel alloys**
 - effects of radiation on electric conductivity and hardness of, 7: 2306
- Beryllium oxide crucibles**
 - properties and fabrication, 7: 3076
- Beryllium oxide glass**
 - thermal properties and determination of cooling-hole distribution for reactor reflectors of, 7: 3213
- Beryllium oxides**
 - ball milling, 7: 1980(J)
 - thermal properties and determination of cooling-hole distribution for reactor reflectors of, 7: 3213
- Beryllium poisoning**
 - (See also appropriate subheadings under **Beryllium**.)
 - therapeutic uses of salicylic and sulfosalicylic acid in, 7: 2728(R)
- Beta decay**
 - (See also appropriate subheadings under elements and isotopes.)
 - allowed and forbidden, theory, 7: 3282(J)
 - allowed and forbidden transitions, tables for analysis of, 7: 2422
 - angular correlation in, calculation of distribution functions taking into account nuclear charge, 7: 3565(J)
 - angular correlation in, multiple interference effects, 7: 3279(J)
 - angular correlation in, theory, 7: 3624(J)
 - average charge of daughter atoms after, 7: 3107(R)
 - compensation for small pseudoscalar matrix element in, 7: 2924(J)
 - contribution of binding energy of electron shells to, 7: 3623(J)
 - determination of ratio of K capture to positron emission, 7: 3637(J)
 - effects of atomic electron on, 7: 3624(J)
 - effects of coulomb forces on isotopic spin selection rules in, 7: 2386(J)
 - effects of cross terms in general expression for, on Kurie plot, 7: 2192(J)
 - effects of finite de Broglie wavelength in, 7: 2873(R), 3658(J)
 - electrino occurrence in, 7: 3650(J)
 - elements of nuclear matrix for odd nuclei, 7: 2708(J)
 - emission of atomic electrons in coincidence with, 7: 2196(J)
 - Fermi term in, survey of most suitable β transitions for determination of, 7: 2642(J)
 - interpretation by shell model, 7: 3281(J)
 - ionization of K or L shells of atoms from, probability, 7: 3272(J)
 - measurement of low-energy, using proportional detectors, 7: 3529(J)
 - of mirror nuclei, matrix elements for, 7: 3622(J)
 - with mixed invariants, interference terms and symmetry in theory of, 7: 3267(J)
 - nucleon-lepton interaction in, 7: 3271(J)
 - numerical values of the Fermi function $F(Z,W)$, calculation, 7: 2699(J)
 - radiative correction to matrix element of, 7: 2211(J)

Beta decay (Cont'd)

- selection rule for transitions involving more than one nucleon, theory of, application of nuclear spectroscopy to, 7: 3573(J)
- Beta particles**
 - From nuclear processes; including negatrons; see also subheadings concerning beta reactions under specific elements and isotopes; see also **Electrons**; **Positrons**.)
 - absolute counting of, from thick planar samples, 7: 2071(J)
 - from atomic explosions, dosage determinations, 7: 2970
 - biological effects and dosage determinations in tissues, 7: 3306
 - from carbon (C^{14}), efficiency of liquid scintillation counter for detection and measurement of, 7: 3512
 - detection and measurement, 7: 3509
 - detection and measurement of, in tracer experiments, 7: 3296(R)
 - effects of prolonged environmental exposure to P^{32} , on gonads of fish, 7: 1877(J)
 - effects on biochemical oxidation in sewage, 7: 3303
 - effects on gonads and thyroid glands in mice following chronic doses of I^{131} , 7: 2963(J)
 - effects on plants, studies with P^{32} -labeled fertilizer, 7: 2234(J)
 - emitted by oriented nuclei, directional distribution and polarization of, 7: 3564(J)
 - latent carcinogenic action of, stimulation by croton oil, 7: 2950
 - measurement, review of counter tubes for, 7: 3165(J)
 - measurement in solutions, efficiency of G-M tubes for, 7: 3534(J)
 - pathological effects of, and induction of tumors by, in rats, 7: 2727(R)
 - permissible limits of, in water supplies, 7: 3325
 - sensitivity of salivary glands to, 7: 3309(J)
- Beta spectrometers**
 - accuracy and calibration of, improvement in, 7: 3540(J)
 - annular correction for magnetic lens, 7: 3523(J)
 - axial and radial focusing in, calculation of, 7: 3522(J)
 - axial-focusing magnetic, design, 7: 2059
 - double-coincidence, design and properties, 7: 3524(J)
 - double-focusing, design and performance, 7: 2428(J)
 - magnetic electron-lens, design, 7: 2862(J)
 - magnetic-lens, use of caustic curve in, 7: 3526(J)
 - in measuring Compton electrons from γ -irradiated target, 7: 3530(J)
 - precision limitations of conical-source, homogeneous-field, axial-focusing, magnetic, 7: 2608
 - with prism and double focusings by air-core coil, 7: 3521(J)
 - proportional tubes used as, advantages and difficulties in, 7: 3529(J)
 - single-purpose high-resolution or high-precision, advantages of separate, 7: 3527(J)
 - with thin-window low-pressure gas-filled G-M tubes, design of, 7: 2605
 - with tilted sources, experimental line shapes arising from, 7: 2932
 - with uniform magnetic field, design of, 7: 2070(J)
- Beta spectroscopy**
 - techniques, survey of, 7: 3161(J)
- Betatrons**
 - for x-ray therapy, design of 31-Mev, 7: 2973(J)
- Bevatron**
 - magnet design, 7: 3600
- Bibliographies**
 - (See also as subheading under specific subjects.)
 - on fluorides, 7: 2513
 - on electrolytic methods for synthesis of organic compounds, 7: 3354
 - on high-temperature oxidation of metals, 7: 3448
 - on solid hydroxides, 7: 2499
- Big Rock Candy Mountain Area (Utah)**
 - uranium distribution and geochemistry, 7: 3077(R)
- 2,2'-Biquinoline**
 - in colorimetric determination of trace amounts of Cu, 7: 2768
- Bismuth**
 - electrodeposition from molten mixtures of Bi_2O_3 and NaCl-CaCl_2 eutectic, 7: 3451
 - neutron total cross sections, 7: 2123(J), 2871(J)
 - spectrophotometric determination with HCl, 7: 3363(J)
- Bismuth (liquid)**
 - corrosive effects on steel, 7: 2296
 - neutron diffraction and atomic distribution in, 7: 2337(J)
 - solubility of C and O in, 7: 3357(J)
- Bismuth isotopes Bi^{200}**
 - deuteron reactions (d,p) and (d,t), proton and triton spectra, 7: 2406(J)
 - gyromagnetic ratios and nuclear magnetic moments, 7: 2128(J)
 - nuclear quadrupole spectrum of, in triphenylbismuth, 7: 3212(J)
- Bismuth isotopes Bi^{210}**
 - absorption by blood corpuscles and plasma, 7: 2254(J)
 - beta decay, compensation for small pseudoscalar matrix element in, 7: 2924(J)

Bismuth isotopes Bi²¹⁰ (Cont'd)

- beta decay, emission of atomic electrons in coincidence with, 7: 2196(J)
- gamma and β spectra, 7: 3626(J)
- half life, 7: 2688(J)

Bismuth isotopes Bi²¹²

- absorption by blood corpuscles and plasma, 7: 2254(J)
- beta spectra, 7: 2882(J)

Bismuth isotopes Bi²¹⁴

- beta decay, 7: 3629(J)
- decay schemes, 7: 3280(J)
- gamma spectrum, 7: 3630(J)

Bismuth-lead alloys (liquid)

- effects of wetting on heat transfer characteristics of, 7: 3412
- flowmetering, 7: 2548
- stress-rupture and corrosion of type 347 stainless steel in, 7: 2566(R)

Bismuth-tin alloys

- magnetic properties and superconductivity of, 7: 3454(R)

Black oxide

(See Uranium(IV-VI) oxides.)

Black sands

(See also Thorium ores.)

- spectrophotometric analysis for Th, 7: 3007

Black sands (Calif.)

- analysis, 7: 3435(R)

Blast

(See Shock waves.)

Blast effects

- pulmonary edema, cholinergic drugs in prophylaxis of, 7: 2732

Blood

- catalase activity of, determination and effects of radiation on, 7: 2729(R)
- radioinduced chemical changes in, in burros, 7: 2731(R)

Blood cells

(See also Erythrocytes.)

- effects of radiation on circulating, in tadpoles, 7: 1872

Blood circulation

- disturbances in the extremities, examination with I¹³¹, 7: 2221(J)

Blood plasma

- absorption of thoron decay products by, and labeling of, 7: 2254(J)
- chromatographic separation of lipids, 7: 3042
- prophylactic effects of injected, against radiation injuries in mice, 7: 2727(R)
- proteins, in neoplastic disease, 7: 3297(R)
- radiometric analysis, scintillation techniques for, 7: 3170(J)
- volume determination in man with chromic chloride, 7: 2749
- volume determination in man simultaneously with determination of erythrocyte mass, using sodium chromate and chromic chloride, 7: 2748

Blood plasma substitutes

(See also specific substitutes.)

- oxypolygelatin solutions, tolerance, toxicity, and caloric availability in rabbits, 7: 2719

Blood pressure

- effects of partial shielding on radioinduced hypotension, in chicks, 7: 2727(R)

Blood serum

- analysis for protein-bound I, 7: 2960(R)
- iodination of, factors affecting, 7: 2960(R)
- proteins of, ultracentrifugal separation and sedimentation constants, 7: 2782
- sodium and K levels in, effects of radiation on, 7: 2733

Blood transfusions

- effects on radiosensitivity of dogs, negative results, 7: 2730(R)

Boiling

- bubble formation in, 7: 3067
- factors facilitating, under actual conditions, 7: 3072(J)
- of gas-filled liquid, velocity of, 7: 3071(J)
- two-phase pressure drop and burnout of boiling water flowing in channels, 7: 1971

Bone marrow

(See also Hematopoietic system.)

- effects of radiation on biochemistry of, in rabbits, 7: 1881(J), 3310(J)
- implants, therapeutic uses in radiation sickness, 7: 3329
- in therapy of radiation injuries in mice and guinea pigs, 7: 1899(J)

Bone Valley Formation (Fla.)

- geology, 7: 3081

Bones

- calcium metabolism by, tracer study, 7: 3338
- calcium tolerance test in metabolism studies of, 7: 2480(R)
- effect of local x radiation on growth and metabolism of, in rats, 7: 2226
- effects of whole-body x radiation on growth and metabolism of, in rats, 7: 2227

Bones (Cont'd)

- effects of x radiation on growing spine, 7: 2228(J)
- morphology of, electron microscope studies, 7: 2947(J)

Boranes

(See Boron hydrides.)

Borate complexes

- with thienyltrifluoroacetone, 7: 2501

Borazole

- molecular structure in solid state and synthesis of, 7: 2269
- preparation, 7: 1916(R)

Borines

- chemical properties, preparation, and vapor pressure of, 7: 1915(R)

Borines, methylamino-

- crystal structure, 7: 2771

Boring

(See Rock drilling.)

Boron

- colorimetric determination in Na by alcohol extractions, 7: 2765
- crystal structure, 7: 2771
- electric conductivity, 7: 2318(R)

Boron chlorides

- bond energies and heats of formation and solution of BCl₃, 7: 2497
- preparation, chemical properties, and vapor pressure of, 7: 1916(R)

Boron fluorides

- dissociation of, mass spectrometric measurement, 7: 2609
- drift velocities of electrons in BF₃, 7: 2086(J)

Boron hydrides

- chemical properties and preparation of, 7: 1916(R)
- exchange reactions with D and deuterated diborane, 7: 3377(J)
- heat of reaction of B₂H₆ and B₃H₉, 7: 2497

Boron isotopes B¹⁰

- alpha reactions (α, p), 7: 3590(J)
- deuteron reactions (d, α), 7: 3587(J)
- energy levels, deuteron scattering, and proton scattering of, 7: 3466(R)
- gamma reactions (γ, α) and (γ, α, γ), 7: 3225(J)
- gyromagnetic ratios and nuclear magnetic moments, 7: 2128(J)
- neutron reactions (n, α), γ spectrum of, 7: 2143(J)
- nuclear spins, by intermediate-coupling approximation, 7: 3576(J)

Boron isotopes B¹¹

- deuteron reactions (d, n), angular distributions, 7: 3594(J)
- deuteron reactions (d, p), 7: 3466(R)
- gamma reactions (γ, α) and (γ, α, γ), 7: 3225(J)
- proton reactions (p, γ), resonant energies for, 7: 2889(J)
- proton reactions (p, γ) and (p, α), angular distribution correlation with angular momenta coupling, 7: 2140(J)

Boron isotopes B¹²

- energy levels, from reaction B¹¹(d, p), 7: 3466(R)
- half life, 7: 2695(J)

Boron-titanium systems

- constitution diagrams and mechanical properties, 7: 3103

Bosons

(Elementary particles with integral or zero spins; see also Elementary particles.)

- angular moment and parity of systems of, selection rules, 7: 2209(J)

Boundary layer

- friction and heat-transfer characteristics, effect of thermal properties on, 7: 2794
- hydrodynamic characteristics, 7: 3065
- turbulent, theory of, 7: 2795

Brain

- metabolism of phospholipids by, and effects of corticotropin on, 7: 2977

Brain tumors

- radiometric localization of, computational procedure for, 7: 2253(J)

Brass

- effects of α particles on β , 7: 2417(J)
- radiation damage in, x-ray-diffraction methods for evaluating, 7: 2177(R)

Brazier Canyon (Utah)

- uranium distribution, 7: 3441

Breasts

- x-ray transmission through, rate of, 7: 3333(J)

Breeder reactors

(See also Power breeder reactors.)

- fissionable-isotope production in, theoretical considerations regarding, 7: 2395

Bremsstrahlung

- emission in electron-electron collision, cross section for, 7: 2342(J)
- emission by spin- $\frac{1}{2}$ particle interacting with spin- $\frac{n}{2}$ particle, theory, 7: 2210(J)

- Bremsstrahlung (Cont'd)**
intensity distribution of, from 11-Mev electrons, 7: 2680(J)
polarization of high-energy, 7: 3478(J)
- British reactors**
(See **BEPO**.)
- Bromides**
quantitative distillation of metal, 7: 2255
- Bromine**
bremsstrahlung reactions (γ, α), energy spectrum of α particles from, 7: 2405(J)
- Bromine fluorides**
infrared and ultraviolet spectrum of BrF_3 , 7: 2531(R)
refractive indexes of trifluoride-pentafluoride mixtures, 7: 1936
- Bromine ions (recoil)**
epithermal reactions in alkyl bromides, 7: 3389
- Bromine isotopes Br^{79}**
nuclear magnetic resonance lines in cubic crystals of KBr , 7: 2132(J)
- Bromine isotopes Br^{80}**
gamma emission of 18-min, 7: 2925(J)
isomeric transition, average charge after, 7: 3107(R)
separation of isomeric recoil atoms by ion exchange, 7: 1949(J)
- Bromine isotopes Br^{81}**
nuclear magnetic resonance lines in cubic crystals of KBr , 7: 2132(J)
- Bromine isotopes Br^{82}**
substitution reactions of neutron-activated, with nitrobenzene and methyl and ethyl benzoates, 7: 2519(J)
- Brookhaven National Lab.**
annual report for 1952, 7: 1857
meteorology, relation of shearing stress to wind profiles, 7: 2098(J)
meteorology, variation of turbulence spectrum with height, 7: 2099(J)
progress report of unclassified section, 7: 2317(R)
- Brookhaven synchrotron**
design and operating characteristics, review, 7: 2890
operation, 7: 2317(R)
- Brown oxide**
(See **Uranium(IV) oxides**.)
- Brown Univ.**
progress reports on r-f Cockcroft-Walton generator for neutron studies, 7: 2664(R)
- Buckland-Kiwalik District (Alaska)**
geography, mineralogy, and prospecting, 7: 3083
- Bull Canyon District (Colo.)**
prospecting, 7: 2557
- Bullion Monarch Mine (Utah)**
geology, mineralogy, uranium distribution, and prospecting, 7: 3077(R)
- Bulloch Group (Utah)**
uranium distribution and prospecting, 7: 2555
- Bureau of Mines, College Park, Md.**
progress reports on effect of atmospheric contaminants on arc welds in Ti, 7: 1995(R)
- Burners**
(See **Incinerators**.)
- Burns**
(See also subheadings for biological effects under **Infrared radiation**, **Thermal radiation**, and **Radiation**; see also appropriate subheadings under specific tissues and materials.)
effects of combined total-body x irradiation and, on mice, 7: 2724
from NaK, protection against and therapy of, 7: 2726(R)
phospholipid changes in skin induced by, 7: 2962
- Burros**
 $\text{LD}_{50/30}$ for γ radiation, 7: 2731(R)
- 1-Butanol**
diffusion coefficients of CS_2 and, as function of pressure, 7: 2987
diffusion of HgCl_2 in, effect of pressure on, 7: 2988
- 2-Butanol**
diffusion coefficients of CS_2 and, as function of pressure, 7: 2987
- Butyl phosphates**
solvent partition of Ge(IV) in, 7: 3348(R)
- C**
- Cadmium**
electrodeposition at a Hg cathode, 7: 2255
neutron total cross sections, 7: 3205(J)
neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, 7: 2875
neutron total cross sections between 30 and 153 Mev, 7: 3206(J)
volumetric determination with 2-(*o*-hydroxyphenyl)-benzoxazole reagent, 7: 3010
- Cadmium complexes**
with cyanide, reduction, 7: 2255
with tropolone, chemical stability, 7: 2788
- Cadmium-gold alloys**
diffusionless phase changes, 7: 2305(R)
diffusionless phase changes, cubic-tetragonal transformation, and electric conductivity of, 7: 2817(R)
- Cadmium isotopes Cd^{110}**
energy levels, from decay of In^{110} , 7: 3198
energy levels, from decay of In^{112} , 7: 3198
- Cadmium isotopes Cd^{111}**
energy levels of isomeric, from $\text{Cd}^{110}(\text{n}, \gamma)$ and $\text{Cd}^{111}(\text{n}, \text{n}') \text{ reactions}$, 7: 2908(J)
- Cadmium isotopes Cd^{114}**
excited states, 7: 2428(J)
- Cadmium isotopes Cd^{115}**
beta decay of isomeric, selection rule for, 7: 3621(J)
- Cadmium tungstate crystals**
effects of α irradiation on fluorescence of, 7: 3615(J)
- Cages**
(See **Metabolism cages**.)
- Calcium**
metabolism in plants, and effects of estrogen on metabolism in cattle, 7: 2731(R)
neutron-capture gamma rays from, 7: 3107(R)
reaction with water vapor in temperature range 177 to 344°C, 7: 3349
tissue distribution, effects of radiation on, 7: 2728(R)
tissue distribution of intravenously injected, 7: 3338
tolerance test, in bone metabolism studies, 7: 2480(R)
transport in crayfish nerve, 7: 1905
- Calcium chlorides**
diffusion in aqueous solutions, effect of pressure on, 7: 2988
hydration in nonaqueous solvents, 7: 1912
- Calcium complexes**
with phosphates and phytate, chemical stability of, 7: 3002
with tropolone, chemical stability, 7: 2788
- Calcium fluoride crucibles**
sintered, cause for deterioration of, 7: 3075
- Calcium fluorides**
sintering, 7: 3424
thermoluminescence in x-ray-colored, 7: 2420(J)
- Calcium ions**
self-diffusion coefficients in aqueous CaCl_2 solutions at 25°C, 7: 2762
- Calcium isotopes Ca^{40}**
energy levels, 7: 3466(R)
- Calcium isotopes Ca^{45}**
half life, 7: 2125(J)
- Calcium nitrates**
diffusion in aqueous solutions, effect of pressure on, 7: 2988
- Calcium titanates**
x-ray spectra, 7: 2933(R)
- Calculators**
(See **Computers**.)
- California**
exploration, 7: 3435(R)
uranium and thorium occurrences in, bibliography on, 7: 3438
- Calorimeters**
adiabatic, design and performance in range 15 to 300°K, 7: 2824
- Calutrons**
filament-life extension in, 7: 3501
- Cameras**
high-speed turbine driven, 7: 2347
- Cancer**
(See **Tumors**.)
- Candle Creek Area (Alaska)**
prospecting and mineralogy, 7: 3083
- Cane sugar**
(See **Sucrose**.)
- Cape Nome Area (Alaska)**
prospecting for radioactive deposits in, 7: 1982
- Capillaries**
permeability of, effect of natural radioactive waters on, 7: 2474(J)
- Capture cross sections**
(See appropriate subheadings under specific elements and isotopes; see **Neutron cross sections**.)
- Carbides**
of elements Br to U, compilation of vapor-pressure data for, 7: 2758
- Carbinols**
synthesis, 7: 3053
- Carbon**
(See also **Carbon black**; **Diamonds**; **Graphite**.)

Carbon (Cont'd)

- activities produced in, by N^{+13} ion bombardment, 7: 2150(J)
 deuteron and proton scattering by, 7: 2578(R)
 helium ion (He^3) reactions with, activities produced by, 7: 2887(J)
 μ -meson capture by, electromagnetic radiation spectrum from, 7: 2864
 mesons produced by α particle and neutron bombardment of, 5: 2578(R)
 metabolism, tracer study, 7: 3296(R)
 metabolism in mice, effects of radiation on, 7: 2235(J)
 metabolism in plants, 7: 2750
 neutron production by cosmic rays in, as function of latitude and altitude, 7: 3123(J)
 neutron reactions (n,γ), cross sections for, 7: 2655
 neutron total cross sections, 7: 3205(J)
 neutron total cross sections between 30 and 153 Mev, 7: 3206(J)
 neutron total cross sections in 3- to 12-Mev region, 7: 2123(J)
 pair production cross section at 2.62 Mev, 7: 2130(J)
 path in photosynthesis, review, 7: 2764
 penetrating cosmic showers under, rates of occurrence, 7: 3122(J)
 photomeson production from, 7: 3465(R)
 proton reactions (p,n), energy distribution of neutrons from, 7: 2142(J), 3596(J)
 reaction with steam at 1800 to 2500°F, 7: 2259(J)
 solubility in liquid Bi, 7: 3357(J)
- Carbon (activated)
 (See also Charcoal.)
 in separation of binary mixtures of gases, 7: 2838(J)
 structural types of, 7: 3400
- Carbon arcs
 operation and monitoring of, 7: 2324
- Carbon black
 surface area measurements by flow methods, 7: 1973(R)
- Carbon-chromium-titanium systems
 constitution diagrams, 7: 3461
- Carbon dioxide-water systems
 chemical reactions induced in, by electric discharge, 7: 2837
- Carbon dioxides
 (See also Carbon dioxide-water systems; Photosynthesis.)
 energy loss distribution of 1.3-Mev electrons in, 7: 2906(J)
 epithermal reactions of recoil atoms in, 7: 3389
 excited metastable, existence in graphite combustion, 7: 1943(J)
 ionization by particles, 7: 3327(R)
 quenching of photons in proportional counters filled with, 7: 3533(J)
 radiation chemistry, 7: 2778(R)
- Carbon fluorides
 (See Carbon tetrafluoride; Fluorocarbons.)
- Carbon ions
 range-energy relation in nuclear emulsions, 7: 2673(J)
- Carbon isotopes
 alpha reactions (α,α), differential scattering cross sections for, 7: 2893
 separation by chemical exchange in thermal diffusion columns, 7: 2272(R)
- Carbon isotopes C^{11}
 half life, 7: 2887(J), 3593(J)
- Carbon isotopes C^{12}
 deuteron reactions (d,p), angular distributions at 1.3 Mev, 7: 2657(J)
 neutron reactions (n,π^-), angular distributions, 7: 2628
 parity and spin of 4.47-Mev level, 7: 3594(J)
 proton reactions (p,γ), resonant energies for, 7: 2889(J)
 proton reactions (p,γ), angular distribution of γ rays from, 7: 2392(J)
- Carbon isotopes C^{13}
 effects of methyl labeling by, on hfs of triphenylmethyl, 7: 3199(J)
 energy levels, from α bombardment of Be^9 , 7: 3590(J)
 isotopic exchange between CO and CO₂, kinetics and catalysis of, 7: 2272(R)
 proton reactions (p,γ), angular distribution correlation with angular momenta coupling, 7: 2140(J)
- Carbon isotopes C^{14}
 in age estimations of geological samples, 7: 3429(R)
 beta decay, average charge of daughter, 7: 3107(R)
 detection with scintillation technique, 7: 2087(J)
 radiometric determination of benzoic acid labeled with, using vibrating-reed electrometer, 7: 1931(J)
- Carbon-manganese-titanium systems
 constitution diagrams, 7: 3461
- Carbon monoxides
 catalytic oxidation over Cu, 7: 2760(R)
 excited metastable, existence in graphite combustion, 7: 1943(J)
- Carbon steel
 corrosion, mechanism of, 7: 3475(J)
 diffusion of D₂ from D₂O through, 7: 3475(J)
- Carbon sulfides
 diffusion coefficients in chlorobenzene, 1-butanol, and 2-butanol as function of pressure, 7: 2987
 diffusion in n-heptane, 2,4-dimethylpentane, toluene, methylcyclohexane, and n-octane, 7: 2755
 self-diffusion, effect of pressure on, 7: 2756
- Carbon tetrafluoride
 carbon-fluorine bond distance in, measurement of, 7: 2775(J)
 elastic scattering and neutralization of hydrogen ions in, 7: 3611(J)
- Carbon-titanium systems
 constitution diagrams and mechanical properties, 7: 3103
- Carbon-uranium sandstone deposits (Utah)
 genesis and mineralogy, 7: 3434
 occurrence, 7: 2558
- Carbon-zirconium silicate systems
 chlorination, 7: 2560
- Carbonium compounds
 molecular rearrangement, 7: 3348(R)
- Carnegie Inst. of Tech.
 progress reports on phenomena relating to interactions of particles and radiation, 7: 3188(R), 3189(R), 3190(R),
- Carnotites
 chemical and physical properties of core samples, 7: 3082(R)
 spectrographic analysis for U₃O₈, 7: 2804(J)
- Cascade impactors
 design, 7: 2542(R)
- Cascade showers
 (See also appropriate subheadings under radiation inducing showers.)
 nucleon, experimental investigation in H₂O, 7: 2913(J)
- Cascades
 secondary turbulent flow in tandem, 7: 3065
- Casting
 (See also Furnaces; Heaters.)
 machine for vacuum die, design, 7: 3667(P)
- Catalysts
 (See headings by material, e.g., Nickel catalysts.)
- Cataracts
 radioinduced, 7: 3308(J)
 radioinduced, comparison of local and systemic exposures in production of, 7: 2470(J)
- Cathode-ray tubes
 (See also Electron tubes.)
 identification of positive and negative ions causing failure in, 7: 3503(J)
 intensification of beam, 7: 3139
- Cathode rays
 (See also Electrons.)
 intensification, 7: 3139
- Cathodes
 (See also Cathode-ray tubes; Electron tubes.)
 oxide-coated, effects of O on electron emission from, 7: 2830(J)
 oxide-coated, mechanism of electric conductivity in, 7: 2590(R)
- Cation exchanging materials
 for anion analysis of uranyl salts in water, 7: 2500
- Cattle
 metabolism of Cs¹³⁷ in, 7: 2943
- Cavity resonators
 for bunching electron beams, design, 7: 2320(R)
 design, 7: 3499(R)
 electric field measurements in, by "glo-ball" method, 7: 2855
 surface gradient vs. electrode contour, 7: 2826
- Cell physiology
 radioautographic techniques in study of, 7: 3296(R)
- Cells
 (See Animal cells; Storage batteries.)
- Centrifuges
 ultrafiltration apparatus for use with, design, 7: 2960(R)
- Ceramals
 (See Cermets.)
- Ceramic coatings
 preparation and radiation effects on, 7: 2940(R)
- Ceramic crucibles
 fabrication and sources of supply, 7: 3076
- Ceramic-metal systems
 (See Cermets.)
- Cerium
 electrochromatographic separation, 7: 1955(J)
 spectrophotometric determination in presence of Th, 7: 2769(R)
- Cerium complexes
 chemical properties, 7: 3485(R)
 spectrophotometric determination of peroxide complex, 7: 2255

- Cerium compounds
interatomic electric quadrupole-quadrupole coupling in, 7: 2931(J)
- Cerium cyanamides
preparation and properties, 7: 2523(J)
- Cerium fluorides
crystal structure and preparation, 7: 3110
- Cerium(IV) ions
reduction in acid solution by Po α particles, 7: 3031(J)
reduction in H_2SO_4 solution by α rays, 7: 2777
- Cerium isotopes Ce^{141}
gamma spectra, 7: 2853, 3141(R)
- Cerium isotopes Ce^{144}
gamma spectra, 7: 2853
- Cerium-magnesium alloys
creep at 250 and 300°C, effect of additions on, 7: 2000(J)
- Cerium oxide-uranium oxide systems
crystal structure and electric conductivity, 7: 3408(J)
phase studies, 7: 3409(J)
- Cerium perchlorates
oxidation of water by, 7: 3033
- Cerium sulfates
radical yield ratio of ionizing radiation in, 7: 2176
- Cermet-metal couples
interfacial reactions, 7: 3099(R)
- Cermets
interactions at high temperatures, 7: 2551
- Cesium antimonides
photoelectric properties, 7: 3498(R)
- Cesium isotopes Cs^{137}
gamma spectra, 7: 3278(J)
- Cesium isotopes Cs^{132}
positron emission and half life, 7: 3278(J)
- Cesium isotopes Cs^{139}
gamma spectra, 7: 3278(J)
- Cesium isotopes Cs^{131}
nuclear spins and magnetic moments, 7: 3207(J)
- Cesium isotopes Cs^{132}
gamma spectra, 7: 3278(J)
- Cesium isotopes Cs^{133}
hyperfine structure of ground state of, determination, 7: 2590(R)
- Cesium isotopes Cs^{134}
decay scheme, 7: 3632(J)
internal conversion, K/L + M ratios, 7: 2694(J)
nuclear spins and magnetic moments, 7: 3207(J)
- Cesium isotopes Cs^{137}
diffusion and migration of ionic, in NaCl, 7: 1961(J)
internal conversion, K/L + M ratios, 7: 2694(J)
K Auger electron intensities of, measurement and interpretation, 7: 2186(J)
metabolism in chickens, cattle, sheep, swine, and rats, 7: 2943
- Chalk River Project (Canada)
progress reports on electronics, 7: 2611(R)
- Chandalar District (Alaska)
prospecting for Th and U, 7: 2801
- Charcoal
(See also Carbon (activated).)
structural types of, 7: 3400
- Chelates
(See also organic compounds used as chelation agents; see also main headings by name of metal chelated, e.g., Uranium chelates; see also appropriate subheadings under specific materials.)
effects on isolated mammalian heart, 7: 2944
in ion-exchange and chromatographic separations, 7: 2273
of organic S compounds, properties, 7: 2498(R)
in separation of Th from rare earths, 7: 2769(R)
- Chemical isomerism
isomeric forms for 6-coordinate compounds with terdentate ligands and ligands of higher function, 7: 2761
- Chemical radiation detectors
ferrous sulfate and KI solutions as, tracer studies, 7: 3539(J)
ferrous sulfate in H_2BO_3 and in Li_2SO_4 solutions as, 7: 2518
for high-level γ and neutron monitoring of reactors, 7: 2050
- Chemicals and reagents
(See also specific chemicals and reagents.)
effects of radiation on absorption spectra of, 7: 3391(R)
- Chemiluminescence
(See Luminescence.)
- Cherenkov radiation
emission of, theory, 7: 2874(J)
energy loss of relativistic ionizing particles by, 7: 2915(J)
- Cherenkov radiation (Cont'd)
propagation in dispersive medium, dependence on phase velocity, 7: 3239(J)
- Chicago Univ.
progress reports on hydrides and borohydrides of light-weight elements and related compounds, 7: 1916(R)
progress reports on structure and properties of graphite, 7: 2266(R)
- Chickens
(See also Eggs.)
effects of α rays and Atabrine on feathering in, 7: 2238(J)
metabolism of Cs^{137} in, 7: 2943
- Chlorides
of divalent metals, hydration in nonaqueous solvents, 7: 1912
- Chlorine fluorides
reactions with benzene derivatives and CCl_4 , 7: 3383(J)
surface tension and viscosity of liquid ClF_3 , 7: 3023(J)
- Chlorine ions
self-diffusion coefficients in aqueous CaCl_2 solutions at 25°C, 7: 2762
- Chlorine isotopes
electric quadrupole resonance in HgCl_2 , 7: 3203(J)
nuclear quadrupole resonance in CH_2ClCOOH , 7: 2647(J)
nuclear quadrupole resonance in p-dichlorobenzene, 7: 2648(J)
- Chlorine isotopes Cl^{35}
gyromagnetic ratios and nuclear magnetic moments, 7: 2128(J)
nuclear quadrupole resonance lines in metal chlorides and oxychlorides, 7: 2644(J)
- Chlorine isotopes Cl^{36}
beta decay, emission of atomic electrons in coincidence with, 7: 2196(J)
- Chlorine isotopes Cl^{37}
gyromagnetic ratios and nuclear magnetic moments, 7: 2128(J)
nuclear quadrupole resonance lines in metal chlorides and oxychlorides, 7: 2644(J)
- Chloroaromatic compounds
synthesis, 7: 1939(J)
- Chlorohydrocarbons
corrosive effects on Ti, Zr, and stainless steel, 7: 3427(J)
- Chlorophylls
chromatographic separation and determination of the pheophytins in, 7: 2780
photochemical reactions, 7: 2997
- Chloroplasts
pigments, chromatographic separation, 7: 1954
- Cholanthrene, 3-methyl-
carcinogenic effects of Ra and, on guinea pigs, 7: 3316(J)
- Cholesterol
animal metabolism, 7: 1862(R)
animal metabolism and biosynthesis of, factors controlling, 7: 2217
biosynthesis, mechanism for, 7: 1862(R)
biosynthesis by liver, tracer studies, 7: 1903
effects of dietary, on *in vitro* synthesis of, 7: 1902
radiation decomposition of C^{14} -labeled, during storage, 7: 3030
- Choline
separation and assay in animal tissues, 7: 3038
- Choline chloride
radiation decomposition of C^{14} -labeled, during storage, 7: 3030
- Cholinergic drugs
in prophylaxis of lung edema produced by air blasts, 7: 2732
- Chromatographic separations
of chloroplast pigments, 7: 1954(J)
- Chromatography
chelates in, 7: 2273
paper, of radioactive substances, review and bibliography, 7: 3399(J)
- Chromel
(See Chromium-nickel alloys.)
- Chromium
magnetic structure of, neutron-diffraction measurements, 7: 3131(J)
vacuum fusion analysis for oxygen, 7: 2766
- Chromium-aluminum-nickel-titanium alloys
aging characteristics, 7: 2567(R)
- Chromium-aluminum-titanium alloys
constitution diagrams and mechanical properties, 7: 3458
- Chromium-carbon-titanium systems
constitution diagrams, 7: 3461
- Chromium compounds
fine structure near x-ray absorption edges, 7: 2319
- Chromium-iron alloys
oxidation at 800 and 1250°, mechanism of, 7: 2822
- Chromium-iron-titanium alloys
mechanical properties and thermal expansion, 7: 3418
- Chromium isotopes Cr^{48}
decay schemes and half life, 7: 3261

- Chromium-nickel alloys
corrosion by liquid Na at 1000°C, **7: 2312(J)**
deformation characteristics of, in creep at elevated temperatures, **7: 2567(R)**
- Chromium-nitrogen-titanium systems
constitution diagrams, **7: 3461**
- Chromium-oxygen-titanium systems
phase studies in Ti-rich region, **7: 2570**
- Chromium-titanium alloys
constitution diagrams and mechanical properties, **7: 3458**
welds in, ductility of, **7: 3447(R)**
- Chromosomes
(See also **Genetics; Mitosis.**)
effects of O on radiation-induced changes in, of Tradescantia, **7: 1878(J)**, **1890(J)**
effects of O on radiation-induced changes in, of Drosophila, **7: 1883(J)**
x-ray-induced ring, in maize, **7: 3311(J)**
- Chymotrypsin
enzyme-inhibitor complexes of, thermodynamic studies, **7: 2949(J)**
- Cinerins
metabolism, in cockroaches, tracer study, **7: 1904**
- Circle Hot Spings Area (Alaska)
prospecting for Th and U, **7: 2801**
- Circuits
(Circuits peculiar to a specific instrument are found under the instrument; see also **Coincidence circuits; Timing circuits.**)
electrical field reversing, for decreasing dead time in radiation detectors, **7: 2452(P)**
- Cladding
(See as subheading under base material; see by name of material of the coating.)
- Clem Mountain Area (Alaska)
uranium distribution, **7: 3083**
- Clinton formation
prospecting, **7: 2559**
- Cloud chambers
application of multiple scattering theory to measurements in, **7: 2916(J)**
continuous, design and performance of, **7: 3528(J)**
control circuits, design, **7: 2859(J)**
design, **7: 3603**
diffusion, use in nucleation studies, **7: 2369(J)**
in momentum determination of charged particles in axially symmetric magnetic fields, **7: 2860(J)**
in study of scattering of fast neutrons in O, **7: 2165(J)**
valves for, design, **7: 2625(J)**
- Clouds
compositions and temperatures of stratospheric, determination of, **7: 2097**
- Club Mesa (Colo.)
exploration, **7: 3082(R)**
- Coal Canyon (Wyo.)
uranium distribution, **7: 3441**
- Coatings
(See also names of coatings identified by materials and by method of application; see also as subheading under base materials.)
leaks in, method for testing for, **7: 3669(P)**
- Cobalt
metabolism, tracer study, **7: 3296(R)**
metabolism by Neurospora, **7: 3298**
neutron capture gamma rays from, **7: 3107(R)**
neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, **7: 2875**
- Cobalt chloride-2-propanol, 2-methyl--water systems
phase studies, **7: 2993**
- Cobalt chlorides
absorption from organic solvents on anion exchange resins, **7: 3045(J)**
- Cobalt(II) chlorides
heats of solution in water and organic solvents, **7: 2752**
- Cobalt complexes
hydration in nonaqueous solvents, **7: 1912**
reflection spectra in visible region, **7: 1956**
with tropolone, chemical stability, **7: 2788**
- Cobalt(III) complexes
aquation kinetics of diamine, **7: 2754**
with ethylenediamine, reaction kinetics with reagents in aqueous solutions, **7: 2990**
- Cobalt-iron alloys
atomic magnetic moments by neutron diffraction, **7: 2873(R)**
- Cobalt-iron-molybdenum alloys
phase studies at 1200°C, **7: 2561**
- Cobalt isotopes Co⁵⁷
nuclear spin and magnetic moment, **7: 2881(J)**
- Cobalt isotopes Co⁵⁸
aligned, magnetic moment and γ emission from, **7: 3574(J)**
- Cobalt isotopes Co⁶⁰
aligned, angular distribution of γ rays from, **7: 3572(J)**
aligned, magnetic moment and γ emission from, **7: 3574(J)**
gamma emission, precision measurement of, **7: 3162(J)**
half life, **7: 2688(J)**
neutron activation cross sections, **7: 2116**
nuclear polarization in paramagnetic salts, **7: 3562(J)**
preparation of carrier-free, by paper chromatography, **7: 2783(J)**
therapeutic uses of, review, **7: 2481(J)**
as tracer in biological studies, **7: 3341**
- Cobalt nitrates
absorption from organic solvents on anion exchange resins, **7: 3045(J)**
- Cockcroft-Walton accelerators
for neutron studies, design, **7: 2664(R)**
as pulsable neutron generator, design, **7: 2160(J)**
voltage multiplying circuits, modification of, **7: 2892(J)**
- Coding
(See as subheading under names of things coded, e.g., **Computers.**)
- Coincidence circuits
(Circuits peculiar to specific instruments are indexed with the instruments.)
delayed, for half-life determination of mixed nuclides, **7: 2068(J)**
fast, for experiments with high-energy particles, **7: 2028**
for scintillation detectors, design, **7: 2374(J)**
- Coincidence counters
fast, design and performance in detecting high-energy particles, **7: 3535(J)**
- Collimators
design, **7: 3603**
- Colorado
geophysical exploration, **7: 3431**
- Colorado (Montrose Co.)
salt wash sediments in, collection and examination of samples of, **7: 2557**
carnotite ores from, original-state core studies of, **7: 3082(R)**
- Colorado (San Miguel Co.)
salt wash sediments in, collection and examination of samples of, **7: 2557**
- Colorado (Summit Co.)
radiometric reconnaissance near, **7: 3080**
- Colorado Plateau
carnotite ores from, original-state core studies of, **7: 3082(R)**
geology, mineralogy and uranium distribution, **7: 3437**
geophysical exploration, **7: 3431**
uranium ores from, age estimation by Pb-U method, **7: 3079**
- Colorado Plateau (Utah)
uranium distribution, **7: 3434**
- Colorado Univ.
progress reports on energy distribution in luminescence spectra of organic compounds, **7: 2591(R)**
- Columbia Radiation Lab., Columbia Univ.
progress reports, **7: 2320(R)**, **3499(R)**
- Columbia Univ.
progress reports on apparatus for determination of critical temperature of Na, **7: 2351(R)**
progress reports on measurement of specific heat of Na vapor, **7: 2825(R)**
progress reports on prospecting in Marysville area, Utah, **7: 3077(R)**
progress reports on reactions of I atoms in solution, **7: 2763(R)**
progress reports on separation of isotopes by chemical exchange in thermal diffusion columns, **7: 2272(R)**
progress reports on thermal conductivity of D₂O, **7: 2792(R)**
- Columbia Univ. School of Engineering
progress reports on hydrodynamic aspects of low-viscosity fluids, **7: 1974(R)**
- Columbia Univ. School of Mines
progress reports on diffusionless phase changes in solid metals and alloys, **7: 2305(R)**, **2817(R)**
- Columbium
(See **Niobium.**)
- Combustion
(See also as subheading under specific materials.)
effects of radiation on, **7: 2940(R)**
- Communication systems
bibliographies, **7: 2576**
theory and design, **7: 2590(R)**
- Compressible flow
disturbance produced by introduction of a body into, **7: 3415(J)**

- Compressible flow (Cont'd)**
viscous, mathematical solution by means of particle model of the continuum, 7: 3414(J)
- Compton effect**
in homogeneous magnetic field, 7: 3247(J)
- Computer conferences**
on simulation and computing techniques, papers presented at New York City, April 28-May 2, 1952, 7: 3152
- Computers**
(Calculating devices, mechanical and electrical; see also Cybernetics;
Magnetic recording systems.)
general-purpose digital, physics applications for, 7: 2844(J)
manual for ORDVAC operation, 7: 2842
operation of 13-digit floating decimal Model II Card Program Computer at Los Alamos, 7: 2360
performance of analog, 7: 2590(R)
performance of Harwell, 7: 3151
relay, for crystal structure calculations, 7: 2506
- Concrete aggregates**
physical properties, 7: 2425
- Concretes**
(See also Barite concretes; Concrete aggregates; Shielding materials.)
interlocking blocks of lead and, for radiation shielding, 7: 2697(J)
- Conductivity**
(See Electric conductivity; Thermal conductivity.)
- Connolly Creek Area (Alaska)**
uranium distribution, 7: 3083
- Constitution diagrams**
(See also appropriate subheadings under specific materials.)
construction of, use of thermodynamic data in, 7: 2003(J)
- Convection (forced)**
heat transfer, theory, 7: 2796(J)
- Convection (free)**
heat transfer, theory, 7: 2796(J)
in infinite horizontal tube, theory, 7: 2286(J)
method of successive approximations in solution of equations of, 7: 2284(J)
in spherical cavity, theory, 7: 2285(J)
- Conversion electrons**
(See also Beta particles.)
observable angular correlation between, and x ray emitted as atom returns to ground state, 7: 2880
- Converter reactors**
(See Breeder reactors.)
- Cooling**
(See equipment and processes used for cooling; see appropriate subheadings under things cooled.)
- Copper**
adsorption on sphalerites and desorption by NaCN and Na₂S, 7: 2800(R)
annealing effects in irradiated, 7: 2416(R)
colorimetric determination, use of 2,2'-biquinoline in, 7: 2768
corrosion by liquid Na at 1000°C, 7: 2312(J)
dietary, effect on toxic effects of Zn on liver enzymes in rats, 7: 2975
electrochromatographic separation from Ni and Ag, 7: 3036
electron and positron absorption, 7: 2909(J)
electron showers in, radial and longitudinal energy distribution of, 7: 2148(J)
galvanic potentials developed with Cu-Au alloys, 7: 2568(R)
gamma backscattering from, 7: 2896
gamma cross sections, by photon-difference method, 7: 3246(J)
gamma reactions (γ, p), 7: 3221
metabolism, tracer study, 7: 3296(R)
neutron production by cosmic rays in, at 0 to 54° latitude and 30,000 ft pressure altitude, 7: 3123(J)
neutron resonances, 7: 2009(R)
neutron total cross sections, 7: 3205(J)
neutron total cross sections between 30 and 153 Mev, 7: 3206(J)
neutron total cross sections for 14-Mev neutrons, 7: 2871(J)
neutron total cross sections in 3- to 12-Mev region, 7: 2123(J)
neutron transmission, 7: 3519
pair production cross section at 1.33 and 2.62 Mev, 7: 2130(J)
proton reactions (p, n), energy distribution of neutrons from, 7: 3596(J)
radiation absorption, half-value layer, 7: 2898
reactions with HCl at 1800 to 1900°K, 7: 2588
x-ray spectra, 7: 2319
- Copper (liquid)**
surface tension, 7: 3099(R)
- Copper-aluminum alloys**
creep properties, effect of CuAl₂ dispersions on, 7: 1992
fatigue properties at room temperature, effect of CuAl₂ dispersions on, 7: 3096
- Copper-aluminum alloys (Cont'd)**
plastic properties, 7: 2564
stress corrosion in, 7: 3426
structural changes during aging, 7: 2310(J)
- Copper-aluminum crystals**
plastic deformation by repeated shocks, 7: 1999(J)
- Copper-aluminum-magnesium alloys**
recovery of artificially aged, 7: 2309(J)
structural changes during aging, 7: 2310(J)
- Copper-aluminum-zinc alloys**
plastic properties, 7: 2564
- Copper-beryllium alloys**
crystal structure, 7: 3097
effects of radiation on electric conductivity and hardness of, 7: 2306
- Copper catalysts**
decomposition of NH₃ and NO and oxidation of CO over, 7: 2760(R)
- Copper chloride-copper sulfide systems (liquid)**
electric conductivity, 7: 3101(R)
- Copper chlorides**
absorption from organic solvents on anion exchange resins, 7: 3045(J)
- Copper complexes**
with chloride, formation of, 7: 2255
with tropolone, chemical stability, 7: 2788
- Copper fluorides**
preparation and properties, 7: 3380(R)
- Copper-gold compounds (intermetallic)**
galvanic potentials developed with pure Cu, 7: 2568(R)
reaction in, ordering of thermodynamics, 7: 3456(R)
- Copper isotopes Cu⁶³**
nuclear electric quadrupole moment, 7: 3580(J)
- Copper isotopes Cu⁶⁴**
neutron activation cross sections, 7: 2116
- Copper isotopes Cu⁶⁵**
nuclear electric quadrupole moment, 7: 3580(J)
- Copper isotopes Cu⁶⁶**
half-life, 7: 2391(J)
- Copper isotopes Cu⁶⁷**
beta decay and β - γ coincidence measurements, 7: 3273(J)
beta spectra, 7: 2684
- Copper-nickel alloys**
effects of radiation on thermoelectric potential of, 7: 2418(J)
- Copper-silver alloys**
effects of radiation on electric conductivity and hardness of, 7: 2306
- Copper sulfide-copper chloride systems (liquid)**
electric conductivity, 7: 3101(R)
- Copper-titanium alloys**
effects of radiation on electric conductivity and hardness of, 7: 2306
- Copper-uranium sandstone deposits (Utah)**
genesis and mineralogy, 7: 3434
- Corrosion**
(See also appropriate subheadings under corroded materials and units and under corrosive agents; see also Stress corrosion.)
effects on cracking of pressure vessels, review, 7: 2006(J)
- Corticosterones**
chromatographic determination and urinary excretion levels for man, 7: 3006
effects on hematopoietic regeneration of irradiated rat, 7: 3317(J)
- Corticotropin**
effects on metabolism of phospholipids by brain, tracer study, 7: 2977
- Cortisone**
effects on hematopoietic regeneration of irradiated rat, 7: 3317(J)
- Corundum**
(See Aluminum oxides.)
- Cosmic deuterons**
production of 250- to 450-Mev, 7: 3486(J)
- Cosmic electrons**
east-west asymmetry of, 7: 2333
energy spectra measurements of, using plastic scintillation counters, 7: 3494(J)
production of 1-bev, in thunderstorm, 7: 2014(J)
- Cosmic mesons**
east-west effect of positive and negative, 7: 3465(R)
zenithal distribution, 7: 3129(J)
- Cosmic mesons (μ)**
capture in Fe, maximum energy of neutrons produced by, 7: 2870(J)
decay of, contribution to atmospheric electronic component, 7: 2834(J)
production of penetrating secondaries underground by, 7: 2016(J)
- Cosmic mesons (π)**
decay of neutral, contribution to electronic component of cosmic rays, 7: 3128(J)

- Cosmic mesons (π) (Cont'd)**
 production by cosmic neutrons, **7: 2334(J)**
 production in S, Sn, and Pb, mechanism of, **7: 2833(J)**
- Cosmic neutrons**
 diffusion in atmosphere, calculations, **7: 3483(J)**
 east-west asymmetry at sea level, absence of, **7: 2335(J)**
 production of protons and π mesons by, **7: 2334(J)**
- Cosmic particles**
 (See also specific particles by name.)
 angular distribution of prongs of stars induced by, **7: 2017(J)**
 cascade initiation in nucleus by, **7: 2153(J)**
 decay of a charged 2500-m_e particle, **7: 2867(J)**
 in extensive underground showers, origin of, **7: 3485(J)**
 frequency and energy spectrum of primary, origin in nuclear collisions, **7: 3488(J)**
 heavy, delayed disintegration in nuclear emulsions, **7: 3492(J), 3493(J)**
 lifetimes of unstable, statistical estimation from cloud chamber photographs, **7: 3491(J)**
- Cosmic photons**
 energy spectra measurements of, using plastic scintillation counters, **7: 3194(J)**
- Cosmic protons**
 production by cosmic neutrons, **7: 2334(J)**
- Cosmic radiation**
 (See also specific particles identified with cosmic radiation, e.g., Cosmic neutrons.)
 altitude dependence of the star-magnitude distribution, **7: 3126(J)**
 anomalies in Pb absorption of, correlation with Rossi curve, **7: 2013(J)**
 detection and measurement, **7: 2838(R)**
 detection and measurement, stripped-emulsion technique for, **7: 3520(J)**
 effects of continuous solar emission on diurnal variation in, **7: 3481(J)**
 electronic component, contribution of μ -meson decay to, **7: 2834(J)**
 electronic component, contribution of π^0 meson decay to, **7: 3128(J)**
 energy spectrum of nucleon component at 50°N geomag. latitude, **7: 3126(J)**
 intensity increase during thunderstorms and rainfall, **7: 2014(J)**
 intensity, use of Fe meteorites as indicators of, **7: 3124(J)**
 interaction in Pb, measurement in 10^{12} to 10^{14} ev region, **7: 3117**
 isotropic, relation of kinetic properties of interstellar gas to, **7: 3121(J)**
 neutron production by, as function of latitude, altitude, and atomic weight, **7: 3123(J)**
 nucleonic component, diffusion in the atmosphere, **7: 3482(J)**
 penetrating component, upper-atmospheric influences on, **7: 2835(J)**
 penetrating component, zenithal distribution, **7: 3129(J)**
 primary, lower energy limit of, **7: 2584(J)**
 soft component, theory of spread of, **7: 2332**
 T-tracks in nuclear emulsions at 90,000 ft, search for, **7: 2015(J)**
 underground burst production, contribution of μ - π process to, **7: 3484(J)**
- Cosmic-ray spectra**
 quantitative mathematical description of development of, **7: 3480**
- Cosmic showers**
 barometric and temperature effects on extensive Auger, **7: 3127(J)**
 cross sections for high-energy nuclear collisions in penetrating, **7: 3119(J)**
 detection and measurement of showers wider than 1000 m, **7: 3118**
 effects of air density and temperatures on Auger shower fluctuations, **7: 3489(J)**
 frequency and origin of extensive underground, **7: 3485(J)**
 Rossi curves of Pb, Fe, and graphite, origin of 3rd and 4th maxima in, **7: 3125(J)**
- Cottrell precipitators**
 (See Electrostatic precipitators.)
- Counters**
 (See Coincidence circuits; Radiation detection instruments; Radiation detectors.)
- Cove Mesa (Ariz.)**
 geophysical exploration, **7: 3431**
- Cows**
 (See Cattle.)
- Creep**
 (See also as subheading under specific materials.)
 linear time-temperature relation for extrapolation of and, data on stress-rupture, **7: 2811**
 measurement, design of extensometer for, **7: 3137(R)**
- Critical points**
 (See appropriate subheadings under specific elements.)
- Croton oil**
 stimulation of latent carcinogenic action of β particles by, **7: 2950**
- Cryogenics**
 techniques and materials for use at liquid H temperatures, **7: 2549**
- Cryostats**
 (See Thermostats.)
- Crystal structure***
 (Including crystal imperfections, lattice distortion, crystal deformation, orientation, superlattices, etc.; see also appropriate subheadings under specific materials.)
 deuterium effect on H-bond distances in, **7: 2836**
 local field in cubic lattices, theory, **7: 2429(R)**
 research programs in, at West-European universities, **7: 3097**
- Crystallography**
 diffuse x-ray scattering, interpretation from powder patterns of solid solutions, **7: 2670**
- Crystals**
 (See also main headings by material, e.g., Copper crystals; see also Metal crystals; Polycrystals.)
 fine structure near x-ray absorption edges, **7: 2319**
 plastic deformation by glide, mathematical analysis of, **7: 3132(J)**
- Curium isotopes Cm²⁴²**
 alpha fine structure lines, intensity of, **7: 2690(J)**
 fission products of, radiochemical determination, **7: 3584**
- Cybernetics**
 (See also Communication systems; Computers; Servomechanisms.)
 bibliographies, **7: 2576**
- Cyclobutane**
 crystal structure, **7: 3014**
 synthesis of perdeutero-, **7: 2278(J)**
- Cyclobutene**
 synthesis of perdeutero-, **7: 2278(J)**
- Cyclohexane, methyl-**
 diffusion of CS₂ in, under pressure, **7: 2755**
- Cyclohexanones**
 synthesis, **7: 3053**
- Cyclotrons**
 beam extraction, **7: 2666(J)**
 beam measurement, nuclear plate camera for, **7: 2621(J)**
 beams, magnets, and radiofrequency systems, **7: 3600**
 electron, operating conditions for, **7: 2158(J)**
 heavy-particle acceleration, review, **7: 2157(J)**
 operation of 60-in., **7: 2578(R)**
 radial oscillations, calculation of, **7: 2666(J)**
 shimming, theory of, **7: 2666(J)**
- Cylinders**
 electric conductivity, variational methods for calculating, **7: 3284**
 thermal stresses in, calculation, **7: 3109**
 turbulent wake development behind, in low-speed air flow, **7: 2547**
- Cysteine**
 radiosensitivity effects, **7: 2730(R), 2737**
 radiosensitivity effects on bacteria, **7: 2475(J)**
 radiosensitivity effects on protein coagulation, **7: 3314(J)**
 synthesis of iso-, **7: 2498(R)**
- Cytochrome C**
 effects of radiation on, **7: 1875(J)**
- Cytosine**
 biosynthesis of tritium-labeled, **7: 3296(R)**

D

- David Sarnoff Research Center**
 progress reports on electronic devices for nuclear physics, **7: 3498(R)**
- De Paul Univ.**
 progress reports on scintillation techniques applied to electron energy studies, **7: 3516(R)**
- Decay series**
 nuclear thermodynamics of, **7: 2184**
- Decontaminating solutions**
 for hands, evaluation of, **7: 1894(J)**
 performance, **7: 2799**
 for rubber and neoprene gloves, effectiveness, **7: 2738(R)**
- Decontamination**
 (See also as subheading under units and materials decontaminated; also for studies on the use of special coatings to aid decontamination see Coatings and specific coatings.)
 papers presented at South District Filtration Plant, Chicago, Sept. 1952, **7: 2799**
 vacuum cleaner for, design, **7: 1948(J)**
- Deer Trail Area (Utah)**
 geology and uranium distribution, **7: 3077(R)**
- Deformation**
 (See appropriate subheadings under specific materials deformed; see Plastic deformation.)

- Delta rays**
(See Electrons.)
- Dentine**
(See Teeth.)
- Deuterium**
(See also Deuterons.)
absorption by La, structure changes during, 7: 3017(J)
abundance in sun, 7: 2331(J)
activities produced in, by N^{13} ion bombardment, 7: 2150(J)
charge-exchange scattering of 40-Mev π mesons in, 7: 2087
concentration in natural honey, 7: 2265(J)
deuteron reactions (d,p), cross section for, 7: 2124(J)
diffusion through carbon steel, 7: 3475(J)
effects on H-bond distances in crystals, 7: 2836
exchange reactions of methane with atomic, 7: 3376(J)
exchange reactions with diborane, kinetics of, 7: 3377(J)
exchange with H in KOH, mechanism of, 7: 2256
exchange with potassium amide in NH_3 , mechanism of, 7: 2258
gamma reactions (γ, n), as source of background neutron flux in JEEP, 7: 2396
gamma reactions (γ, π^-), 7: 2578(R)
gamma reactions (γ, π^0), theory, 7: 3180(J)
labeling Raney nickel catalysts with, 7: 2264(J)
metabolic equivalence with tritium, 7: 1908(J)
neutron total cross sections, 7: 2894
nuclear radiofrequency spectrum measurements of, in intermediate and strong magnetic fields, 7: 3568(J)
physical and chemical properties, bibliography on, 7: 2846
spin-rotational interaction constant for accelerated nucleus in, 7: 3569(J)
thermal neutron absorption cross sections, 7: 3107(R)
- Deuterium compounds**
biological effects of, bibliography on, 7: 2746
- Deuterium-hydrogen systems**
exchange reactions, 7: 2272(R)
- Deuterium oxides**
(See Water-d; Water-d₂.)
- Deuteron cross sections**
(See also as subheading under specific isotopes and elements.)
effects of coulomb field on angular distribution of (d,n) and (d,p) reactions, 7: 2402(J)
- Deuterons**
cross sections for formation of compound nuclei by, 7: 3557(J)
deuteron reactions, angular distribution of reaction products from, 7: 2168(J)
deuteron reactions (d,t), cross section and angular distribution of, 7: 3110
magnetic moments, relativistic corrections to, 7: 2883(J)
meso-disintegration of, in terms of strong-coupling meson theory, 7: 2092(J)
 π -meson scattering cross sections, calculation by impulse approximation, 7: 3179(J)
 π^- -meson scattering by, 7: 2897
neutron differential and total scattering cross sections, in range 0.1 to 1.0 Mev, 7: 2901(J)
neutron scattering by, angular distribution and total cross sections of, 7: 2894
neutron scattering by bound, 7: 2167(J)
neutron-scattering cross sections at 90 Mev, by Born approximation, 7: 3610(J)
nuclear magnetic moment ratio of, to protons, 7: 2590(R)
photodisintegration, 7: 2145(J)
photodisintegration cross sections, calculations for γ energies from 2.23 to 20 Mev, 7: 3228(J)
photofission, cross section for inverse of, 7: 2401(J)
polarization and scattering by electric fields, 7: 2175(J)
polarized, theory of nuclear reactions involving, 7: 2639
proton reactions ($p + d \rightarrow t + \pi^0$), cross section for, 7: 2578(R)
proton reactions (p,n), energy distribution of neutrons from, 7: 3596(J)
proton scattering by, 7: 2899
range-energy relations in nuclear emulsions, 7: 2621(J)
scattering by nucleons, charge independence in, 7: 2122
- Devils Tower Area (Wyo.)**
airborne radioactivity survey, 7: 2802
- Dextrose**
(See Glucose.)
- Diabetes**
adrenal function in, 7: 2218
- Diagenesis**
(See as subheading under ore or mineral studied.)
- Diagnosis**
(See as subheading under condition studied.)
- Dialysis**
design of electrodialyzer, 7: 2800(R)
- Diamond drilling**
(See Rock drilling.)
- Diamonds**
absorption spectra, effects of heat and light on, 7: 3251
- Diborane**
(See Boron hydrides.)
- Dibutyl phosphoric acid**
(See Butyl phosphates.)
- Diet**
radiosensitivity effects of cabbages and carrots in, 7: 1888(J)
- Differential analyzers**
(See Computers.)
- Diffusion pumps**
(See also Vacuum pumps.)
linear-jet Hg, design and performance, 7: 3074
- Diketones**
synthesis of α -methylbenzoyltrifluoroacetone, 7: 2787(R)
uranium complexes of, preparation, 7: 3665(P)
- Dirty Devil Group (Utah)**
uranium distribution and mineralogy, 7: 2558
- Distillation apparatus**
(See also Evaporators.)
for preparation of high-purity H_2O , design, 7: 3028
- Dosimeters**
(See Radiation detection instruments (Ion current type); Rate meters.)
- Dosimetry**
(See appropriate subheadings under radiations and materials.)
- Drilling**
(See Rock drilling.)
- Drosophila**
genetic analysis of adaptive values affecting populations, 7: 1866(J)
genetics of homeostasis in, 7: 2456
- Dust exposure chambers**
for radon-inhalation studies in rats, 7: 2961
- Dyes**
(See also specific dyes and classes of dyes.)
phosphorescence, photochemical reactions, and synthesis of, 7: 2997
- Dysprosium**
electric conductivity, heat of sublimation, and vapor pressure, 7: 2318(R)
magnetic properties of metallic, 7: 2424(J)

E

- Earth**
age estimations, 7: 1983
- Eggs**
(See also Embryos.)
effects of x radiation on fertility of sea urchin, 7: 3312(J)
radiation damage to silkworm, recovery from, 7: 1884(J)
- Elastomers**
(See also Rubber.)
decontamination of gloves of, 7: 2738(R)
- Electric arc furnaces**
for preparation of Ti alloys, design, 7: 3103
- Electric arcs**
particle-initiated high-vacuum sparks, 7: 3495
vacuum sparking in relation to electrode contour, 7: 2826
- Electric conductivity**
(See also Resistors.)
a-c space-charge polarization effects in photoconductors, semiconductors, and electrolytes, theory, 7: 3467
calculation of, variational methods for, 7: 3284
measurement, methods for, 7: 3392(R)
measurement in metals and alloys, design of apparatus for, 7: 3454(R)
- Electric discharge**
(See also Electric arcs; Glow discharges.)
chemical reactions induced by h-f, 7: 2338
chemical reactions induced in CO_2-H_2O by, 7: 2837
in gases, review, 7: 2020(J)
- Electric fields**
(See also Magnetic fields.)
electron motion in weak periodic, and homogeneous magnetic fields, 7: 2344(J)
measurement in cavity resonators by "glo-ball" method, 7: 2855
measurement in resonant cavity by perturbation, 7: 2826
particle trajectories in plane, considering space charge, 7: 2326(J)
- Electric furnaces**
(See Electric arc furnaces; Furnaces.)

Electric insulators

- effects of radiation on, **7: 3392(R)**
 x-ray spectra, theory, **7: 2319**

Electric resistance

(See Electric conductivity.)

Electric resistors

(See Resistors.)

Electrochemistry

- electrolytic methods for synthesis of organic compounds, bibliography on, **7: 3354**

Electrolysis

(See also as subheading under materials electrolyzed; see also Corrosion.)

- a-c space-charge polarization effects in, theory, **7: 3467**

Electrolytic cells

(See also Electrolysis; and appropriate subheadings under Isotopes separation methods.)

- for production of Zr, design, **7: 3098(R)**

Electrolytic ionization

- Debye equations, model for, **7: 1911**

Electromagnetic fields

- electron trajectories in, calculation by successive integrations, **7: 2024(J)**

- non-local interaction with electrons, **7: 2205(J)**

- production of uniform, water-cooled Helmholtz coils for, **7: 3145(J)**

Electromagnetic lenses

- axial field in, measurement of, **7: 2023(J)**

Electromagnetic pumps

(Faraday pump; one in which a force is exerted on a liquid conductor in a magnetic field.)

- performance and theory of new high temperature, **7: 1975**

- testing with liquid Pb, **7: 2809(R)**

Electromagnetic separation

(See also Calutrons; Mass spectrography; Mass spectrometers.)

- of light and medium isotopes, design of 60°-sector mass spectrometer for, **7: 2042(J)**

Electromagnetic waves

(See also specific radiations.)

- propagation on helical conductors, **7: 3469**

Electrometers

(See also Electron tubes; Radiation detection instruments (ion current type).)

- for electric resistivity measurement, design, **7: 3392(R)**

- rotating-condenser, design, **7: 2052(R)**

Electron capture

(See also as subheading under specific materials.)

- determination of ratio of K capture to positron emission, **7: 3637(J)**

- effects of atomic electron on, **7: 3634(J)**

- measurement of low-energy, using proportional detectors, **7: 3529(J)**

- orbital, by nuclei, atomic excitation and ionization accompanying, **7: 2689(J)**

- radiation from, detection with 4 π proportional detectors, **7: 2364**

- Sargent diagram for, **7: 3270(J)**

Electron-diffraction analysis

(See also as subheading under specific materials; see also appropriate subheadings under Electrons.)

- apparatus for, employing Geiger-Mueller counters, **7: 2371(J)**

Electron microscopy

- of bone, morphological relationships observed by, **7: 2947(J)**

- microtome for thin sectioning for, design, **7: 2223(J)**

Electron pairs

- momentum transfer and angle of divergence of photon-produced, **7: 2681(J)**

- produced by 70-Mev x rays in nuclear emulsions, angular separation of, **7: 2415(J)**

Electron scattering cross sections

- theory, **7: 2172(J)**

Electron showers

- in copper, radial and longitudinal energy distribution of, **7: 2148(J)**

Electron sources

- solid thermionic, preparation of, **7: 3144(J)**

Electron tubes

(See also Cathode-ray tubes.)

- for microwave generation, design and performance of, **7: 3499(R)**

- performance, **7: 2320(R)**

- testing, **7: 2611(R)**

Electrona Corp.

- progress reports on development of radiacmeter IM-79()/PD, **7: 2361(R)**

Electronic equipment

- for automatically determining current-voltage characteristics of an electrical device, **7: 2447(P)**

Electrons

(For electrons from nuclear sources see also Beta particles; see also Conversion electrons; Cosmic electrons; Leptons; Positrons.)
 absorption in Al, Cu, and Au relative to positron absorption, **7: 2909(J)**
 bremsstrahlung emission in electron-electron collision, cross section for, **7: 2342(J)**

- detection and measurement, scintillation counter for, **7: 3516(R)**

- detection and measurement of low-energy, anthracene scintillation counter for, **7: 3525(J)**

- diffusion in completely ionized gases, **7: 2589(J)**

- effects on fluorescence of anthracene, **7: 3615(J)**

- electron scattering by, theoretical modifications, **7: 2200(J)**

- Fermi-type interaction of, theory, **7: 2212(J)**

- field emission from W, with high vacuum, clean surfaces, and high electric fields, **7: 2339(J)**

- interactions involving a de Broglie field, statistical, **7: 3287(J)**

- knock-on, produced by mesons in Pb, **7: 3176(J)**

- magnetic interaction with neutrons, spin-spin and spin-orbit contributions, **7: 3238(J)**

- mass-to-charge ratio of positrons and, mass-spectrometric comparison of, **7: 2849(J)**

- measurement of Compton, by β spectrometer, **7: 3530(J)**

- motion in weak periodic electric and homogeneous magnetic fields, **7: 2344(J)**

- non-local interaction with electromagnetic fields, **7: 2205(J)**

- quantum mechanical radiation formula for high-energy, in constant magnetic fields, **7: 2340**

- resonance capture from H atoms by slow protons, **7: 2341(J)**

- scattering, effect of damping on radiative corrections and infrared divergencies in, **7: 3609(J)**

- scattering by electrons in Be, **7: 2677(J)**

- scattering by He, calculation of Townsend ionization coefficient, **7: 2903(J)**

- scattering by He ions, application of variational methods to, **7: 2904(J)**

- scattering from various potential fields, tables for second Born approximation, **7: 2678(J)**

- scattering of fast, differential cross section for, **7: 2172(J)**

- secondary emission, time spread and distribution, **7: 3498(R)**

- Thomas-Fermi electron density, theory of, **7: 2343(J)**

- thermodynamics of ensembles of, when perturbed by electromagnetic fields, **7: 2431(J)**

- trajectories of, calculation by successive derivations, **7: 2021(J)**

- trajectories of, calculation by successive integrations, **7: 2024(J)**

Electrophoresis

- Van Gils cell design, **7: 2800(R)**

Electroscopes

(See Radiation detection instruments (ion current type).)

Electrostatic lenses

- for focusing high-energy particles, calculation of trajectories, **7: 2587(J)**

- for focusing high-energy particles, design, **7: 2025(J)**

- immersion objective, focusing conditions and aberrations, **7: 2022(J)**

Electrostatic precipitators

- performance, **7: 2542(R)**

- performance, radiometric evaluation of, **7: 1968(J)**

Elementary particles

(See also specific particles, e.g., Mesons.)

- angular moment and parity of boson systems, selection rules, **7: 2209(J)**

- Coulomb scattering cross section between spin -0 , $-\frac{1}{2}$, and -1 , **7: 3288(J)**

- decay of a charged 2500- m_0 particle, **7: 2867(J)**

- emission of bremsstrahlung by, theory, **7: 2210(J)**

- energy loss of relativistic, by ionization and Cherenkov radiation, **7: 2915(J)**

- fundamental processes in quantum theory of, statistical investigation, **7: 2214(J)**

- interactions, selection rules due to charge conjugation, **7: 2936(J)**

- interactions between unstable, structure of, **7: 3649(J)**

- interactions of charged, potentials in, **7: 2702(J)**

- range-energy relation in nuclear emulsions, **7: 3249(J)**

- scattering of, plural and multiple corrections to, **7: 2166(J)**

- with zero rest mass, theory of spin of, **7: 2433(J)**

Elements

- from bromine to U, compilation of vapor pressure data for, **7: 2758**

Eleostearic acid

- chromatographic determination in triglyceride fraction of blood plasma, **7: 3042**

Emanation

(See Radon.)

- Embryos**
 effects of radiation on rat, **7: 2463(J)**
 effects of radiation on rat, at various ages of gestation, **7: 3322(J)**
 effects of x radiation on development of sea urchin, **7: 3312(J)**
- Endocrine glands**
 effects of total-body irradiation on, in parabiotic rats, **7: 2954**
- Engineering Research Inst., Univ. of Mich.**
 progress reports on utilization of gross fission products, **7: 2940(R)**
- Engines**
 (See Internal combustion engines; Turbojet engines.)
- Eniwetok Atoll**
 exploration and geology, **7: 2554**
- Entropy**
 (See also as subheading under specific materials; see also Thermodynamics.)
 of aqueous organic solutes and complex ions, measurement of, **7: 3001**
 of inorganic complex ions, empirical considerations of, **7: 2579**
 of oxy-anions and related species, measurement of, **7: 2827**
- Enzymes**
 (See also specific enzymes.)
 determination in human pigment cells and pigment-cell neoplasms by labeled tyrosine, **7: 2971(R)**
 effects of H_2O_2 on metabolism of, **7: 1874(J)**
 effects of radiation on activity of, **7: 2729(R)**
 effects of ultraviolet radiation on, **7: 2270**
 effects on differential growth, **7: 3302**
 identification of nucleotide coenzymes, **7: 2750**
 of liver of rats, toxic effects of excessive dietary Zn on, **7: 2975**
 prophylactic effects of injected, against radiation injuries, **7: 2729(R)**
 thermodynamic studies of chymotrypsin-inhibitor, **7: 2949(J)**
- Equation of state**
 determination by fast computing machines, **7: 2599**
- Erbium**
 electric conductivity, **7: 2318(R)**
 magnetic neutron scattering by, **7: 2873(R)**
- Erbium(III) ions**
 paramagnetic scattering of neutrons by, **7: 2009(R)**
- Erbium oxides**
 paramagnetic scattering of neutrons by Er_2O_3 , **7: 3237(J)**
- Erosion**
 (See as subheading under specific materials.)
- Erythrocytes**
 (See also Hemoglobin.)
 absorption of thoron decay products by, and labeling of, **7: 2254(J)**
 mass determination in man, using sodium chromate and chromic chloride, **7: 2748**
- Escherichia coli**
 effects of radiation on adenosine triphosphate metabolism by, **7: 2967(J)**
 effects of radiation on metabolism and development of bacteriophage in, **7: 3315(J)**
 effects of radiation on respiration of, **7: 2728(R), 2965(J)**
 effects of x radiation on formation of lactase by, **7: 3321(J)**
- Esters**
 fluorinated, synthesis of, **7: 3026(J)**
- Estrogens**
 effects on Ca metabolism in cattle, **7: 2731(R)**
- Ethane, chloro-**
 Friedel-Crafts reactions with benzene on $AlCl_3$, **7: 1913**
- Ethane, fluoro-**
 reactions with Na ethoxide, **7: 3025(J)**
- Ethane, hexafluoro-**
 elastic scattering and neutralization of hydrogen ions in, **7: 3611(J)**
- Ethanol**
 permeation through glass, **7: 2524(R)**
 as quenching agent in external-cathode Geiger counters, **7: 2858(J)**
 synthesis of C^{14} -labeled, by a Grignard reaction, **7: 3057(J)**
- Ethanol, 2-dimethylamino-**
 separation and assay in animal tissues, **7: 3038**
- Ethanethiol, 2-amino-**
 radiosensitivity effects, **7: 3328(J)**
- Ether, bis(2-chloroethyl)**
 solvent partition of Ga(III) in, **7: 3348(R)**
- Ethers, fluoroalkyl-**
 synthesis, **7: 3025(J)**
- Ethyl alcohol**
 (See Ethanol.)
- Ethylamine, 2-mercapto-**
 (See Ethanethiol, 2-amino-.)
- Ethylene**
 potential function and vibration frequencies of deuterated, **7: 1933(J)**
 as quenching agent in external-cathode Geiger counters, **7: 2858(J)**
- Ethylene, chlorotrifluoro-**
 infrared spectra and entropy of, **7: 2427**
- Ethylene, chlorotrifluoro- polymers**
 applications in corrosive systems, **7: 2297(J)**
 crystal structure at $211^\circ C$, **7: 3382(J)**
- Ethylene polymers**
 effects of high-energy radiation on, **7: 2521(J)**
 elastic modulus effects of radioinduced cross linking on, **7: 2918**
- Ethylenediamine complexes**
 with cobalt(III), reaction kinetics with reagents in aqueous solutions, **7: 2990**
- Ethylenediaminetetraacetic acid**
 (See Acetic acid, (ethylenediamine)tetra-.)
- Europium isotopes Eu^{152}**
 half life, **7: 2688(J)**
- Europium isotopes Eu^{156}**
 as gamma source in industry, medicine, and research, **7: 2039(J)**
- Evaporation**
 (See also as subheading under specific materials.)
 of liquid drops, theory of heat transfer in, **7: 2796(J)**
- Evaporators**
 (See also Distillation apparatus.)
 vacuum type, design of heater for, **7: 2316**
- Explosions**
 (See also Shock waves.)
 apparent radioactivity induced by shaped-charge, **7: 3631(J)**
- Extensometers**
 for studying plastic flow of materials under stress from deuteron bombardment, **7: 3137(R)**
- External defects**
 (See appropriate subheadings under materials.)
- Extraction apparatus**
 (See Packed columns; Scrubbers.)
- Extrapolation chambers**
 (See Ionization chambers.)
- Extrusion**
 (See as subheading under materials extruded.)
- Eyes**
 effects of radiation on, **7: 2726(R)**
 effects of radiation on, and effects of shielding lens and ciliary body, **7: 3308(J)**
 effects of radiation on vertebrate retina, electrophysiological study of, **7: 3304**
 pathological effects of radiation on, case history, **7: 1892(J)**

F

- Fabrication**
 (See as subheading under materials fabricated.)
- Fall-out**
 (See also as subheading under specific atomic explosions and tests; see also Fission products.)
 monitoring and radiation hazards of, **7: 2453(J)**
 radiation dosage from, contribution of β to, **7: 2970**
- Faraday pumps**
 (See Electromagnetic pumps.)
- Fast neutrons**
 detection, dosimeter for, **7: 3327(R)**
 dosage determinations in human tissue, **7: 2723**
 effects on crystal structure of quartz, **7: 2180(J)**
 effects on fertility of mice, **7: 1880(J)**
 radiosensitivity of barley seed to, **7: 2735(J)**
- Fatigue**
 (See as subheading under specific materials.)
- Fatty acid esters**
 metabolism in rats, tracer study, **7: 3344**
- Fatty acids**
 biosynthesis, tracer study, **7: 3343**
 effects of radiation on metabolism of, **7: 3307(J)**
 effects on synthesis of cholesterol in rabbit tissues, **7: 1862(R)**
- Fermions**
 (Elementary particles with nonintegral spins; see also Electrons; Elementary particles; Mesons; Neutrinos; Neutrons; Protons.)
 interaction, theory, **7: 2212(J)**
 universal interaction of, selection rules for, **7: 3292(J)**
 universal interaction of, symmetry properties of, **7: 3290(J)**

Ferric compounds

(See main headings beginning Iron(III).)

Ferrous compounds

(See main headings beginning Iron(II).)

Fertilizers

effects of P^{32} -labeled, on plant growth, 7: 2234(J)

Fibrinogen

animal metabolism, 7: 1862(R)

Field theory

(See also Quantum electrodynamics.)

affine, new equation in, 7: 2703(J)

analysis of S matrix with causality condition applied, 7: 2712(J)

approximate wave functions for unbound relativistic particles in coulomb field, 7: 2432(J)

coulomb-scattering cross sections between spin-0, $-\frac{1}{2}$, and -1 particles, calculation, 7: 3288(J)

damping of virtual nucleon-pair formation in pseudoscalar meson theory, 7: 3659(J)

derivation of commutation relations between variables via Heisenberg operators, 7: 3641(J)

divergence of perturbation expansions in, 7: 2704(J)

divergence of perturbation theory for quantized fields, 7: 2202(J)

electron scattering from various potential fields, tables for second Born approximation, 7: 2678(J)

gauge invariance in, consequences of, 7: 3646(J)

lagrangian and hamiltonian formalisms, investigation of differences with chronological ordering operators, 7: 3641(J)

linear meson wave equation in de Sitter space, 7: 3653(J)

local and non-local, equivalence of, 7: 3652(J)

non-local, conservation of quanta in, 7: 2937(J)

non-local, possibilities of generalization of, from standpoint of convergence problems, 7: 3654(J)

non-local interactions between electromagnetic field and electron, 7: 2205(J)

non-local interactions in, S matrix for electromagnetic and spinor fields, 7: 3648(J)

non-local theory of nucleon-meson field, 7: 2091(J)

nonrelativistic equation for charged spin- $\frac{3}{2}$ particle in electromagnetic field, 7: 2199

Pais formula for arbitrary particle interacting with arbitrary fields, generalization of, 7: 3647(J)

phase shift and scattering potential, relationships between, 7: 2203(J)

quantized, construction in terms of a single fundamental dynamical principle, 7: 3640

quantized, generalized method for, 7: 3644(J)

quantum, application of distribution analysis to divergencies and ambiguities of, 7: 2713(J)

selection rules due to charge conjugation, 7: 2936(J)

selection rules for universal fermion interaction, 7: 3292(J)

statistical interaction of leptons involving a de Broglie field, 7: 3287(J)

subtractive field theory applied to mass spectra of mesons, 7: 2094(J)

symmetry properties of a universal fermion interaction, 7: 3290(J)

three-nucleon interactions in Yukawa, 7: 2208(J)

Tomonaga interaction representation in, determination of commutation relation and interaction hamiltonian, 7: 3642(J)

WKB-type approximations to solutions of Dirac and Schroedinger wave equations, 7: 3289(J)

Film meters

(See Photographic film detectors.)

Films

(See also specific films under material, e.g., Plastic films; see also Adsorbed films; Monomolecular films; Photographic film; Photographic film detectors.)

preparation of thin mica and formvar, for use in G-M tubes, 7: 2605

Filter materials

(See also specific filter materials.)

efficiency in air cleaning, 7: 2542(R)

Filters

(See also Glass filters.)

fiber, efficiency for aerosol filtration, 7: 3062

glass fiber, for removing particulate matter from gas stream saturated with vapor, 7: 2443(P)

for removal of particles such as oil mist from gases, 7: 2444(P)

trickling, in treatment of radioactive laundry waste, 7: 1966(R)

for use with centrifuges, design, 7: 2960(R)

Fish

from contaminated water, effects of temperature, time, and concentration of isotopes on radioactivity of, 7: 3327(R)

Fission

(See also appropriate subheadings under fissionable elements and isotopes; see also Multiplication factor; Nuclear reactions; Photo-fission.)

Fission (Cont'd)

bibliography on, 7: 2879

interpretation by liquid-drop and collective nuclear models, 7: 2705(J)

Fission chambers

high-sensitivity, design, 7: 2622(J)

Fission products

(See also isotopes of the specific elements produced by fission; see also Fall-out; Radioisotopes.)

from curium (Cm^{242}), radiochemical determination of yields, 7: 3584

decay schemes of U^{235} , calculations on, 7: 2437

industrial uses, 7: 2940(R)

metabolism, by fish, 7: 3327(R)

purification by ion exchange, 7: 3041

spectrographic analysis, 7: 2853

uptake by plants, soil-plants interrelationships in, 7: 2489

Fission sources

(See Neutron sources.)

Flat Area (Alaska)

uranium distribution and geology, 7: 3084

Flint

(See Quartz.)

Florida (Polk Co.)

wavellite spherulites in, 7: 3081

Flowmeters

(See also Fluid flow; Gas flow.)

calibration with liquid Bi-Pb, 7: 2548

electromagnetic, design for liquid Na, 7: 2307

Fluid flow

(See also Convection; Gas flow; Gaseous diffusion process.)

in pipes, pressure drop and burnout of boiling water, 7: 1971

in sealed systems, viscometer for study of, 7: 3500

Fluid flow (laminar)

activation energy and short-range order of, 7: 1972

of thermally insulated viscous gas in supersonic nozzle, 7: 3070(J)

turbulent wake development behind cylinders in low-speed, 7: 2547

Fluid flow (turbulent)

boundary layer theory, 7: 2795

extension of Heisenberg's methods to calculation of critical Reynolds numbers, 7: 3416(J)

heat transfer at low Peclet numbers in smooth tubes, 7: 2545

heat transfer by Hg in pipes, 7: 3069

heat transfer of supercritical H_2O with variable fluid properties in smooth tubes, 7: 3066

of liquids in tubes, heat transfer during, 7: 3068

mass transfer between solid walls and fluid streams, theoretical and interferometric analysis of, 7: 2290(J)

material transfer in, 7: 2291(J)

pressure changes with flow of water through tees, 7: 2793

secondary flow in bends and tandem cascades, 7: 3065

temperature, energy, and pressure gradients in, measurement of, 7: 3417(J)

temperature distribution in heated conduits, methods for prediction, 7: 2292(J)

Fluid fuel reactors

(Reactors with fluid fuels such as liquid metals or fluidized powder, either stationary or circulating but separate from the moderators.)

heat transfer in, effect of turbulence on, 7: 3583(J)

Fluids

(See also fluids by type and specific fluids.)

hydrodynamics of non-viscous, 7: 3473(J)

Fluorescein, diiodo-

synthesis of I^{131} -labeled, from uranin, 7: 2535(J)

tumor diagnosis with I^{131} -labeled, case histories, 7: 2249(J)

Fluorescence

(See also Luminescence; Phosphorescence.)

applications and properties of, 7: 2580

Fluorides

bibliography on, 7: 2513

determination by Volhard method as Pb chlorofluoride, 7: 3371(J)

melting points and volatility data, 7: 3425

preparation and properties, 7: 3380(R)

sintering, 7: 3424

volumetric determination with $CaCl_2$, 7: 3370(J)

Fluorine

chemical properties, 7: 3380(R)

determination by distillation as H_2SiF_6 with water recycling, 7: 2502(J)

determination in urine, 7: 1930(J)

reactions with Na sulfate, sulfite, and thiosulfate, 7: 2515(J)

tissue distribution in rats, 7: 2957(R)

viscosity and collision diameter of gaseous, 7: 1938(J)

Fluorine (liquid)

density and surface tension between 66 and 70°K, 7: 3370

- Fluorine ions**
determination, induced reaction method for, 7: 1927(J)
- Fluorine isotopes F^{18}**
nuclear magnetic moments, exchange contribution to, 7: 2389(J)
nuclear magnetic resonance effects, 7: 2394(J)
proton reactions (p, γ), resonant energies for, 7: 2889(J)
triton reactions (t, p), 7: 2873(R)
- Fluoroaromatic compounds**
synthesis, 7: 1939(J)
- Fluorocarbons**
(Compounds containing only C and F; see also specific compounds.)
crystal structure, 7: 2771
preparation, 7: 2439(P)
- Fluorohalocarbons**
(Compounds containing only C, F, and other halogens; see also specific compounds.)
crystal structure, 7: 2771
- Fluoroorganic compounds**
reactions of perfluorocyclohexyl compounds, 7: 1937(J)
- Fluoroorganic compounds, oxygenated**
acidity and infrared absorption spectra of fluorinated alcohols, 7: 3024(J)
formation of fluoroethers by reaction of fluoroethanes with Na ethoxide, 7: 3025(J)
synthesis of diesters of perfluorocarboxylic acids, 7: 3026(J)
synthesis of esters of perfluorocarboxylic acids with perfluoro alcohols and glycols, 7: 3020(J)
- Fluoroorganic polymers**
synthesis and polymerization of fluorinated styrenes, 7: 3027(J)
- Fluorothene**
(See Ethylene, chlorotrifluoro- polymers.)
- Fluors**
(See Phosphors; Scintillation detectors.)
- Foil detectors**
(See Metal foil detectors.)
- Food**
effects of radiation on, 7: 2940(R)
sterilization, by γ radiation, 7: 2721
- Fordham Univ.**
progress reports on chemistry, 7: 2498(R)
- Formic acid**
radiation chemistry, 7: 2957(R)
- Formylformic acid**
(See Glyoxylic acid.)
- France**
radioactive inclusions in granite from Ploumanac'h, 7: 1985(J)
radioactivity of ampetitic schists of northern, 7: 2301(J)
- Francium isotopes Fr^{223}**
paper chromatographic separation, 7: 3043(J)
- Freedom Mines (Utah)**
uranium distribution, 7: 3077(R)
- Friedel-Crafts reactions**
between gaseous ethyl chloride and benzene on solid $AlCl_3$, 7: 1913
- Fructose**
purification and assay of C^{14} -labeled in end positions, 7: 2767
- Fruit flies**
(See Drosophila.)
- Fungi**
effects of radiation on M. audouini, 7: 2964(J)
oak wilt, response of host to, 7: 3340
radioinduced mutation in Glomerella, genetics and cytology of, 7: 2722
toxicity of S to spores of, 7: 2484
- Furaldehydes**
properties, bibliography on, 7: 3350
- Furnaces**
(See also Electric arc furnaces; Heaters; Vacuum furnaces.)
high-temperature thermal diffusivity, design, 7: 2281
for measurement of thermal properties of non-metallic materials at high temperatures, 7: 2268(R)
- Fused silica**
permeability and solubility of He^3 and He^4 in, 7: 2575
surface tension, 7: 3099(R)
thermal conductivity, 7: 3100(R)
- Gadolinium**
electric properties, 7: 2318(R)
microwave resonance absorption in, 7: 2100(J)
spectra, comparison between theoretical and experimental data, 7: 3638(J)
spectra, L x-ray emission and absorption, 7: 2934(J)
- Galactose**
biosynthesis of C^{14} -labeled, 7: 3051
metabolism by L. bulgaricus strain Gere A, 7: 2942, 3299
- Gallium**
determination in Ga-U alloys, 7: 3358
neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, 7: 2875
solvent partition between β, β' -dichlorodiethyl ether and HCl, 7: 3348(R)
vapor pressure, 7: 2321
- Gallium isotopes Ga^{65}**
half life and positron emission, 7: 3593(J)
positron decay and γ emission, 7: 3268(J)
- Gallium isotopes Ga^{67}**
decay schemes, 7: 3593(J)
- Gallium isotopes Ga^{72}**
in diagnosis of bone tumor metastases, 7: 2247(J)
- Gallium-uranium alloys**
analysis, 7: 3358
- Gamma cross sections**
(See also as subheading under specific materials.)
determination, resolution of photon-difference method for, 7: 3246(J)
total Compton and pair production at 19.5 Mev, measurement and theory, 7: 3606(J)
- Gamma decay**
(See also appropriate subheadings under specific materials.)
angular correlation in, multipole interference effects, 7: 3279(J)
angular correlation in, theory, 7: 3624(J)
effects of coulomb forces on isotopic spin selection rules in, 7: 2386(J)
electric dipole radiation in, regularities in intensity of, 7: 3635(J)
- Gamma radiation**
(See also Photons; X radiation.)
absorption coefficients from 0.3 to 1.5 Mev, 7: 3604(J)
angular correlation, apparatus for study of, 7: 2873(R)
angular correlation of internally converted pairs in anisotropic emission, 7: 3620(J)
angular correlation of successive quanta emitted by oriented nuclei, 7: 3566(J)
angular distribution and polarization of, emitted by oriented nuclei, 7: 3201(J), 3564(J)
angular distribution from aligned nuclei, 7: 3571(J)
attenuation through finite thicknesses and infinite extents of Pb, Fe, and arbitrary materials, build-up factors for, 7: 3602
backscattering, measurement, 7: 2896
biological effects of, as contaminant in reactor thermal-column flux, 7: 1870
Compton electrons ejected from target by, measurement of, 7: 3530(J)
detection and measurement, crystal-photomultiplier for, 7: 2075(J)
detection and measurement, in-line scintillation monitor for, 7: 2604
detection and measurement, photographic film detectors for, 7: 3515(R)
detection and measurement in patients and laboratory animals following injection of tracer amounts of radioisotopes, scintillation-type scanner for, 7: 2958(R)
detection and measurement in tracer experiments, 7: 3296(R)
detection and measurement in waste products, performance of a crystal spectrometer for, 7: 3327(R)
detection and measurement with chemical radiation detectors, 7: 2050
Doppler effect for, applications of high-speed rotation in, 7: 3476(J)
dosage determination, automatic isodose recorder for, 7: 3172(J)
dosage distribution from Ra needles and plaques, photographic method of measuring, 7: 2061
effects on biochemistry of bone marrow, 7: 3310(J)
formation of H_2C_2 by, in aqueous solutions, 7: 2522(J)
internal pair production of, from mesons, 7: 2096(J)
measurement in solutions, efficiency of G-M tubes for, 7: 3534(J)
mixed with thermal neutrons in thermal column, pathological effects, 7: 3324
multiple Compton scattering of low-energy, 7: 2682(J)
nuclear photodisintegrations, review, 7: 2154(J)
pair production by, dependence on atomic number, 7: 2130(J)
penetration, systematic calculations of, 7: 2675(J)
photochemical effects, 7: 3393
polarization of, emitted by aligned nuclei, 7: 3563(J)
polarized, detection by Compton process, 7: 2368(J)
scintillation detection, corrections for Compton electron production and backscattering, 7: 3532(J)

Gadolinites

- energy balance between formation of metamict state and recrystallization, 7: 2302(J)

Gamma radiation (Cont'd)

scintillation detection with 1-naphthylborine, 7: 2069(J)
sterilization of food by, 7: 2721

Gamma sources

cobalt (Co^{60}), for therapeutic use, 7: 2481(J)
cobalt (Co^{60}), uses in accelerating chemical reactions, 7: 3393
containers and shielding facilities for, design, 7: 2198
design of 10,000-c, 7: 2940(R)
dosage distribution from, measurement by photographic method, 7: 2061
for industry, medicine, and research, use of Tm^{170} , Am^{241} , Eu^{155} , and Xe^{133} as low-energy sources, 7: 2039(J)
installation and operation of ten-kilocurie Co^{60} , 7: 3468
for radiosterilization of canned meat products, operation, 7: 2721

Gamma spectra

(See also as subheading under specific elements and isotopes.)
measurement of complex, by use of Compton lines, 7: 3630(J)
from $n + p \rightarrow d + \gamma$ reaction, measurement, 7: 3226(J)

Gamma spectrometers

(See also subheadings concerning detection and measurement under Gamma radiation.)

accuracy and calibration of, improvement in, 7: 3540(J)
automatic recording, design, 7: 2623(J)
design, 7: 3141(R)
magnetic-lens, use of caustic curve in, 7: 3526(J)
performance of, in measurement and identification of radioisotopes in radioactive waste, 7: 3327(R)
performance of gray-wedge, in analysis of decay scheme of I^{131} , 7: 2317(R)
precision extension of curved-crystal, using both (310) and (550) reflection planes of quartz crystals, 7: 3167(J)
resolving power, 7: 3107(R)
scintillation, application to fission product analysis, 7: 2853

Gamma spectroscopy

techniques, survey of, 7: 3161(J)

Gas flow

(See also Convection (forced); Convection (free); Subsonic flow; Supersonic flow.)

in circular and rectangular cylindrical tube heat exchangers, heat transfer and flow friction design data for, 7: 2280
mass transfer in packed columns, effect of fluid properties on, 7: 3413
molecular transport and momentum transfer in capillaries, 7: 2543
resistance in presence of heat exchange, computation of, 7: 2287(J)

Gaseous arcs

(See Electric arcs.)

Gaseous diffusion process

stage enrichment factor and screen area for zero back pressure, equations, 7: 3147

Gaseous discharge

(See Electric discharge.)

Gases

(See also specific gaseous substances.)
analysis for O_2 , 7: 3360
detector for, d-c portable, 7: 1967
diffusion through inert gas barriers, 7: 2847(R)
dissociation, mass spectrometric study of, 7: 2609
effects of isotopic substitution on thermodynamic properties of, 7: 3496
electric discharge in, review, 7: 2020(J)
electric insulating properties of, 7: 2322
electrochemical analysis for oxygen, 7: 3362(J)
entropy of solutions of, 7: 3001
equations of state, relation between coefficients of, 7: 3497(J)
magnetic weighing density balances for, 7: 2596(J)
material transfer in turbulent, 7: 2291(J)
quantum mechanics of collisions between diatomic molecules, 7: 3470
ranges of 10- to 250-kev protons and He ions in, 7: 3234
removal of particles such as oil mist from, filter for, 7: 2444(P)
removal of particulate matter from, glass fiber filter for, 7: 2443(P)
respiratory, bibliography on methods of analysis, 7: 2718
separation by sorption on active carbon, 7: 2838(J)
specific heat, internal friction, and thermal conductivity, method of measurement and data, 7: 2839(J)
specific primary ionization by high-energy electrons, 7: 2638(R)
temperature distribution in turbulent, methods for prediction, 7: 2292(J)
thermal conductivity of polyatomic, theory of, 7: 2027(J)
thermodynamic functions for polyelectronic, at high temperatures, 7: 2026
transport phenomena in completely ionized, 7: 2589(J)
viscosities of polar, calculation over temperature range from 298.16 to 3000°K at pressure of 1 atm., 7: 3135

Geiger-Mueller tubes

(For detection instruments using Geiger-Mueller tubes see also Radiation detection instruments (pulse type).)

apparent dead time in measuring periodically varying radiation, 7: 2084(J)
application to x-ray-diffraction studies, review, 7: 2376(J)
breakdown at high overvoltage, 7: 2064(J)
circuit for reducing deadtime and increasing counting efficiency in, 7: 2616(J)
effects of glass screening on random pulses and sensitivity of, 7: 2076(J)
external cathode, problems in construction of, 7: 2624(J)
external-cathode ethylene-A and alcohol-A filled, comparison tests, 7: 2858(J)
halogen-quenched, applications to health-physics monitoring at AERE, 7: 2617(J)
immersion type, efficiency for measuring β and γ emitters in solution, 7: 3534(J)
Maze-type, construction and characteristics, 7: 2078(J)
Maze-type, photosensitivity of, 7: 2060
for measurement of β particles, characteristics of, 7: 3165(J)
properties of A-Br counters, 7: 2085(J)
radial response of end window, 7: 2601
self-quenching, factors affecting life of, 7: 2620(J)
thin-window low-pressure gas filled, use in β spectrometers, 7: 2605
General Electric Research Lab.
progress reports on development of Zr base alloys, 7: 2818(R), 3457(R)
progress reports on fundamental research in physical metallurgy, 7: 2568(R), 3456(R)

General Teller Mine (Colo.)

prospecting, 7: 3080

Genetics

(See also appropriate subheadings under specific organisms.)
of homeostasis in *Drosophila*, 7: 2456

Geological Survey

progress reports on original-state core studies, 7: 3082(R)

Geology

(See also as subheading under specific materials.)
measurement of geologic time, bibliography on, 7: 1983

Geophysical exploration

(See also as subheading under minerals sought and areas studied.)
instrumentation for, review, 7: 3537(J)
by subsurface isorad method, in Temple Mountain, San Rafael District, Utah, 7: 3078

Germanium(IV) ions

solvent extraction from HCl by organic solvents, 7: 3348(R)

Germanium isotopes Ge^{75}

neutron activation cross sections, 7: 2116

Germanium isotopes Ge^{77}

fission yields, 7: 2146(J)

Germanium isotopes Ge^{78}

half life and fission yields, 7: 2146(J)

Glass

(See also Beryllium oxide glass.)
effects of radiation on, 7: 3390(R)
effects of radiation on coloration of, 7: 3255
luminescence in α -irradiated, 7: 2419(J)
rheological properties at elevated temperatures, 7: 3073

Glass filters

permeation of azeotropic systems, benzene, methanol, and ethanol through, 7: 2524(R)

Globulin

effects of radiation on physicochemical properties of, 7: 1876(J)
radiosterilization, 7: 2940(R)

Glow discharges

oscillations in 500 to 2500 Mc range, study with Hg vapor tubes, 7: 2590(R)

Glucose

metabolism by *L. bulgaricus* strain Gere A, 7: 3299

Glutamic acid

in synthesis of glycine, 7: 3402

Glutathione

radiosensitivity effects on mice, 7: 3324
radiosensitivity effects on protein coagulation, 7: 3314(J)

Glycerol

biosynthesis of C^{14} -labeled, 7: 3051

Glycine

radiation chemistry of Ca and Na salts of, 7: 2957(R)
synthesis from glutamic and glyoxylic acids, 7: 3402

Glycogen

effects of whole-body x irradiation on utilization by liver, 7: 1893(J)

- Glycolic acid, calcium salts
radiation decomposition of C^{14} -labeled during storage, **7: 3030**
- Glyoxime, dimethyl-
crystal structure determined by x-ray diffraction, **7: 2586**
- Glyoxime, dimethyl-, nickel derivatives
crystal structure determined by x-ray diffraction, **7: 2586**
- Glyoxylic acid
in synthesis of glycine, **7: 3402**
- Gold
alpha reactions, analysis of secondary particles from, **7: 2656**
corrosion by liquid NaOH, **7: 2553(R)**
electron and positron absorption in, **7: 2909(J)**
lattice vacancies in irradiated, **7: 2416(R)**
neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, **7: 2875**
neutron total cross sections for 14-Mev neutrons, **7: 2871(J)**
tissue distribution in mice, **7: 2730(R)**
- Gold Bench Area (Alaska)
prospecting for Th and U, **7: 2801**
- Gold-cadmium alloys
diffusionless phase changes, cubic-tetragonal transformation, and electric conductivity of, **7: 2817(R)**
diffusionless phase changes in, **7: 2305(R)**
- Gold-copper compounds (Intermetallic)
galvanic potentials developed with pure Cu, **7: 2568(R)**
thermodynamics of ordering reaction in, **7: 3456(R)**
- Gold isotopes Au^{198}
angular correlation measurements of cascade γ rays from decay of, **7: 3263(J)**
beta decay and spin of ground state, **7: 3627(J)**
colloidal, use in obtaining liver scintigrams, **7: 3345(J)**
cytological effects in effusion following intracavitary administration, **7: 2454(R)**
half life, **7: 2688(J)**
intracavitary injection of colloidal, apparatus for, **7: 2483(J)**
intracavity and interstitial administration methods for colloidal, **7: 2457(J)**
K Auger electron intensities of, measurement and interpretation, **7: 2186(J)**
lethal dosage determinations in mice, **7: 2730(R)**
pathological changes following intracavitary injection of, **7: 3334(J)**
silver-coated colloids of, lymphatic drainage following therapeutic doses of, **7: 3332(J)**
tissue distribution and pathological effects of colloids of, after tracheal instillation in lungs, **7: 2736(J)**
- Gold-nickel alloys
diffuse x-ray scattering by, interpretation from powder patterns, **7: 2670**
- Gonads
effects of chronic doses of I^{131} on, in mice, **7: 2963(J)**
effects of fast neutrons on fertility of mice, **7: 1880(J)**
effects of prolonged environmental β particles on, of fish, **7: 1877(J)**
effects of radiation on ovarian follicles, **7: 2230(J)**
pathological effects of radiation on ovaries, **7: 2466(J)**
radioautographic observations on corpus luteum, using S^{35} , **7: 2251(J)**
- Granite
radioactive inclusions in, from Ploumanac'h, France, **7: 1985(J)**
- Granite Mountain Area (Alaska)
prospecting, **7: 3083**
- Grants Area (N. Mex.)
geobotanical prospecting in U-bearing areas, **7: 2803**
- Graphite
(See also Carbon.)
anisotropic magnetic susceptibility of, **7: 1946(J)**
ball milling, **7: 1980(J)**
combustion of, photogenesis and excited metastable centers in, **7: 1943(J)**
crystal structure, electric conductivity, and reaction kinetics of, **7: 2266(R)**
emissivity, **7: 3100(R)**
properties and industrial uses, **7: 1941(J)**
relaxation time of conduction electrons in, **7: 2267**
synthesis at room temperature and 35,000 atm pressure, **7: 1944(J)**
synthetic, density measurement by fluid displacement method, **7: 1942(J)**
thermal conductivity at 3300 to 3700°K, **7: 2516(J)**
thermal properties and determination of cooling-hole distribution for reactor reflectors of, **7: 3213**
- Graphite compounds
electric conductivity of interstitial, **7: 2776(J)**
- Graphite crucibles
properties and fabrication, **7: 3076**
- Graphite crystals
electric conductivity between 80 and 500°K, **7: 3385(J)**
- Graphite powders
pressing, **7: 1940(R), 3384(R)**
- Graphite-sodium compounds
gels, electron-microscopic study, **7: 1945(J)**
- Graphitic oxides
gels, electron-microscopic study, **7: 1945(J)**
- Greases
(See also Lubricants; Oils.)
preparation and properties of, for use at -65° to +450°F, **7: 2797(R)**
- Green salt
(See Uranium(IV) fluorides.)
- Ground states
(See appropriate subheadings under specific materials.)
- Group theory
(See as subheading under Reactors.)
- Growth
(See also as subheading under plants and animals.)
effects of radiation on, of Paramesium and of organs of mice, **7: 2727(R)**
natural plant regulators of, methods of assay for, **7: 2728(R)**
of plants cultured with enriched levels of N^{15} , **7: 2728(R)**
- Guanine
biosynthesis of tritium-labeled, **7: 3296(R)**
metabolism by *T. geleii*, **7: 2941**
synthesis of tritium- or deuterium-labeled, **7: 3406(J)**
- Gyromagnetic ratio
(See as subheading under specific materials.)
- ## H
- Hafnium
abundance ratio to Zr and specific radioactivity in ores, **7: 3443(J)**
spectrographic determination in Zr, **7: 1928(J)**
- Hafnium(IV) chlorides
enthalpy, **7: 3472(J)**
- Hafnium hydrides
effects on metal-metal bonds of increased concentration of H in HfH_2 , **7: 2751**
- Hafnium isotopes Hf^{181}
decay scheme, **7: 3531(J)**
gamma-ray angular correlations in, **7: 2009(R)**
- Hafnium(IV) oxides
enthalpy, **7: 3472(J)**
- Hafnium-zirconium alloys
lattice parameters, **7: 2315(J)**
- Half lives
(See as subheading under specific isotopes.)
- Halides
dehydration and preparation of low-valency inorganic, for use as ion sources, **7: 2994**
- Handbooks and manuals
analytical procedures for determination of U and Pu, **7: 1922**
- Hands
anatomy of back of, significance in x-ray therapy of tumors, **7: 2969(J)**
- Hastelloy
(See Nickel alloys.)
- Head
radiation dosage determinations, **7: 2972**
- Heart
effects of (ethylenediamine)tetraacetic acid and other chelating agents on isolated guinea pig, **7: 2944**
radiocardiographic techniques, modifications for, **7: 2491(J)**
- Heat exchangers
circular and cylindrical, heat transfer and flow friction design data for gas flow in, **7: 2280**
welding of tube-to-header type, evaluation of cone-arc process, **7: 3102**
- Heat-resisting alloys
(See also specific alloys.)
creep and stress-rupture of, **7: 2811**
- Heat transfer
(See also appropriate subheadings under units and shapes; see also Boiling; Convection; Heat exchangers; Sublimation; Thermal conductivity; Thermal radiation.)
differential equations of, stable numerical solution, **7: 1970**
effect of a thermal factor on intensity of, **7: 2283(J)**
in fluid fuel reactors, effect of turbulence on, **7: 3583(J)**
forced convection, in molten NaOH, **7: 2546**
graphical solutions of non-boiling and surface boiling equations, **7: 2544**
of laminar boundary layer, effect of thermal properties on, **7: 2794**
at low Peclet numbers in smooth tubes with application to liquid metals, theory, **7: 2545**

Heat transfer (Cont'd)

- by natural and forced convection and evaporation, theory, 7: 2796(J)
- resistance of gas flow in presence of, computation of, 7: 2287(J)
- in solid mass with internal heat sources, computation of, 7: 2282(J)
- of supercritical H₂O with variable fluid properties in smooth tubes, 7: 3066
- during turbulent flow of liquids in tubes, 7: 3068

Heaters

- (See also Furnaces.)
- resistance heaters for vacuum evaporation, 7: 2316

Heavy water

- (See Water-d, etc.)

Heavy water reactors

- (See also specific heavy water reactors.)
- effects of delayed photoneutrons in, on kinetics of, 7: 3217(J)

Helium

- (See also Alpha particles.)
- charge states of He beam in, 7: 2832(J)
- electron scattering by, calculation of Townsend ionization coefficient, 7: 2903(J)
- excitation scattering of electrons from, calculation of cross section for, 7: 2676(J)
- ionization by α particles, 7: 3327(R)
- ionization by α particles, measurement of energy per ion pair formed, 7: 2326(J)
- relativistic contribution to magnetic moment of 3S_1 state, calculation, 7: 2430(J)
- specific primary ionization by high-energy electrons, 7: 2638(R)

Helium (liquid)

- discontinuities and high-amplitude sound in He II, 7: 3113(J)
- hydrodynamics of He(II), 7: 3473(J)
- hydrodynamics of solutions of foreign particles in He II, 7: 3114(J)
- kinetic coefficients in He II, 7: 2328(J)
- liquefier-cryostat, miniature cascade-type, 7: 3387(J)
- properties, review, 7: 2330(J)
- second-sound pulse amplitudes and viscosity, measurement, 7: 2590(R)
- sound in solutions of foreign particles in He II, 7: 3112(J)
- structure of, from x-ray scattering, 7: 3477(J)
- thermal conductivity and sound absorption in He II, 7: 2329(J)
- thermal expansion coefficient, 7: 3474(J)

Helium ion beams (He⁺)

- nuclear reactions of, 7: 3593(J)
- nuclear reactions of, examination with nuclear emulsions, 7: 3589(J)
- reactions in Be, C, O, and Ni exposed to 21-Mev, 7: 2887(J)

Helium ions

- (See also Alpha particles.)
- charge states of, in H, He, air, and A, 7: 2832(J)
- electron scattering by, application of variational methods to, 7: 2904(J)
- fine structure of, 7: 2320(R)

Helium isotopes (liquid)

- properties, review, 7: 2330(J)

Helium isotopes He³

- deuteron reactions (d, α) cross sections, 7: 2884(J)
- deuteron reactions (d, p), angular distribution, 7: 3597(J)
- permeability and solubility in vitreous silica, 7: 2575
- production in Fe meteorites, use as cosmic-ray meter, 7: 3124(J)
- reactions with He³, 7: 2009(R)
- recovery and purification of, used in Chalk River ion accelerator, 7: 2581(J)
- vapor-liquid equilibria in solutions of He⁴ and, 7: 2583(J)

Helium isotopes He³ (liquid)

- entropy curve of, from vapor-pressure equation, 7: 2582(J)

Helium isotopes He⁴

- permeability and solubility in vitreous silica, 7: 2575
- vapor-liquid equilibria in solutions of He³ with, 7: 2583(J)

Helium isotopes He⁴ (liquid)

- macroscopic hydrodynamic equations for mixtures of He³ (liquid) and, 7: 2831(J)

Helium isotopes He⁶

- nuclear binding energy, theory, 7: 3208(J)
- nuclear excited states and mass, 7: 2885(J)

Hematopoietic system

- (See also Bone Marrow.)
- effects of malignant tumors on, 7: 3316(J)
- effects of suprarenal hormones on regeneration of, in irradiated rat, 7: 3317(J)

Hemoglobin

- (See also Erythrocytes.)
- biosynthesis, effects of Po on, 7: 2982

Heptane

- diffusion of CS₂ in, under pressure, 7: 2755

Hiroshima

- clinical observations on persons exposed to atomic bomb at, summary, 7: 1901(J)

Histology

- (See also as subheading under specific materials.)
- detection of α -labeled substances in tissue sections with fluorescent chemicals, 7: 2459(J), 2460(J)

Hogs

- (See Swine.)

Holmium

- x-ray emission and absorption spectra of, 7: 2935(J)

Horizons, Inc.

- progress reports on extraction of Zr by electrolysis of fused salts, 7: 3098(R)

Hormones

- (See also specific hormones and appropriate subheadings under organs, glands, and biological processes.)
- chromatographic separation of pituitary, 7: 3297(R)
- effects of pituitary, on thyroid function, 7: 2983(J)
- effects on developing nervous system, 7: 3302
- effects on P metabolism by uterus, radioautographic study with P³², 7: 2252(J)
- preparation of labeled pituitary, 7: 3297(R)
- radiosensitivity effects of anterior pituitary, in rats and guinea pigs, 7: 1898(J)

Howard Univ.

- progress reports on synthesis of Zr, Th, and U silicates, 7: 3403(R)

Hunter Creek Area (Alaska)

- uranium distribution, 7: 3083

Hydrocarbons

- pyrolysis and radiation chemistry of, 7: 3392(R)

Hydrochloric acid

- absorption from organic solvents onto anion exchange resins, 7: 3045(J)
- corrosion embrittlement of Ta, Zr, and Zr alloys in, 7: 3428(J)
- as reagent in spectrophotometric determination of Bi, Pb, and Tl, 7: 3363(J)
- spectrophotometric determination, 7: 3392(R)

Hydrofluoric acid

- base strengths of aromatic hydrocarbons in anhydrous, 7: 3022(J)
- bond energies, dipole moments, and wave functions, calculated, 7: 3021(J)
- conductances of KF, benzene, and methyl-substituted benzenes in, 7: 3022(J)
- preparation of high-purity, 7: 3022(J)

Hydrogen

- adsorption and solution by dispersed Ni-Pd alloys, 7: 3048(J)
 - adsorption and solution by dispersed Pt-Pd alloys, 7: 2277(J)
 - bond distances in crystals, D effect on, 7: 2836
 - charge-exchange scattering of 40-Mev π mesons in, 7: 2087
 - charge states of He beam in, 7: 2832(J)
 - electron-ion recombination in, 7: 2590(R)
 - exchange reactions, 7: 2272(R)
 - exchange with potassium amide in NH₃, mechanism of, 7: 2258
 - exchange with KOH, mechanism of, 7: 2256
 - gamma reactions (γ, n^0), 7: 3175(J)
 - hyperfine structure, 7: 2320(R)
 - ionization by α particles, 7: 3327(R)
 - μ^+ -meson total cross sections, 7: 3173
 - π^+ -meson scattering cross sections, 7: 2911(J)
 - metabolism, tracer study, 7: 3296(R)
 - neutron capture cross sections, 7: 2117
 - neutron capture cross sections, measurement by technique of pile oscillation, 7: 2876
 - neutron scattering cross sections, temperature dependence of, 7: 2173(J)
 - neutron total cross sections, 7: 3205(J)
 - neutron total cross sections from 3 to 12 Mev, 7: 2123(J)
 - neutron total cross sections from 30 to 153 Mev, 7: 3206(J)
 - nuclear magnetic resonance effects, 7: 2394(J)
 - nuclear radiofrequency spectrum measurements of, in intermediate and strong magnetic fields, 7: 3568(J)
 - ortho-para conversion by cuprous acetate in quinoline, 7: 2257
 - photomeson production from, 7: 3465(R)
 - physical properties at low temperatures, 7: 2549
 - resonance capture of electrons from, by slow protons, 7: 2341(J)
 - specific primary ionization by high-energy electrons, 7: 2638(R)
 - spin-rotational interaction constant for accelerated nucleus in, 7: 3569(J)
- Hydrogen (liquid)
- penetrating cosmic showers under, search for, 7: 3122(J)
 - production and storage of 85% para, 7: 2991

- Hydrogen chlorides
(See Hydrochloric acid.)
- Hydrogen fluorides
(See Hydrofluoric acid.)
- Hydrogen ion concentration
measurement of microelectrode assembly for, 7: 3141(R)
- Hydrogen ions
(See also Protons.)
elastic scattering and neutralization in CF_4 and C_2F_6 , 7: 3611(J)
- Hydrogen isotopes
fractionation in biological systems, 7: 2948(J)
preferential incorporation in liver fractions, 7: 2948(J)
tracer techniques for using, 7: 3296(R)
- Hydrogen isotopes H^1
(See Hydrogen.)
- Hydrogen isotopes H^2
(See Deuterium.)
- Hydrogen isotopes H^3
(See Tritium.)
- Hydrogen-nitrogen systems
thermal diffusion ratio in, 7: 2346(J)
solid-vapor equilibrium in, 7: 2549
- Hydrogen-oxygen-sodium systems
phase studies, 7: 3351
- Hydrogen peroxides
effects on cell metabolism, enzymes, and proteins, 7: 1874(J)
formation by γ rays in aqueous solutions, 7: 2522(J)
formation by γ rays in H_2O and aqueous benzene solutions, 7: 2779(J)
- Hydrogen sulfides
entropy and heat of formation, 7: 2828
- Hydrogen-titanium systems
(See also Titanium hydrides.)
preparation and properties, 7: 1996
- Hydrogen-zirconium systems
diffusion, ductility, and phase studies of, 7: 2807
neutron scattering cross sections, 7: 3107(R)
- Hydroxides
bibliography on, 7: 2499
- Hydroxides (gaseous)
high-temperature reactions, 7: 2588
- Hydroxyl radical
microwave spectrum of free, 7: 2635(J)
- 8-Hydroxyquinoline
(See 8-Quinolinol.)
- Hypophysis
(See Pituitary gland.)
- Hypoxia
(See Anoxia.)
- I
- Ice
crystal structure and entropy of, 7: 3373
 τ -meson production in, 7: 3181(J)
neutron scattering by, and by heavy ice, 7: 2167(J)
- ~~Isotopes~~
exploration, 7: 3435(R)
uranium and thorium occurrences in, bibliography on, 7: 3438
uranium distribution, 7: 3441
- Illinois Univ.
progress reports on effects of high-energy radiation on chemical systems, 7: 3391(R)
progress reports on radiation damage and recovery, 7: 2416(R)
- Illium R alloy
(See Nickel alloys.)
- Immunity
effects of radiation on, 7: 3305
to injected E. enteritidis and E. coli, effects of x radiation on, 7: 3301
- Immunization
effects of radiation on antibody production, 7: 2952
- Incinerators
conventional refuse-type, evaluation for disposing radioactive waste, 7: 3061(R)
- Inconel
(See Nickel alloys.)
- Indian corn
(See Maize.)
- Indium
neutron transmission, 7: 3519
polarographic determination, 7: 2255
solvent extraction, 7: 3465(R)
- Indium isotopes In^{110}
decay schemes, 7: 3198
- Indium isotopes In^{112}
decay schemes, 7: 3198
- Indium isotopes In^{113}
gyromagnetic ratios and nuclear magnetic moments, 7: 2128(J)
isomeric state from In^{118} ($\gamma, 2n$) reaction, 7: 3591(J)
K Auger electron yields of, from Sn^{113} , 7: 2186(J)
nuclear energy levels, 7: 2197(J)
- Indium isotopes In^{114}
beta and γ spectra and β end point of, 7: 2428(J)
isomeric state from In^{118} (γ, n) reaction, 7: 3591(J)
- Indium isotopes In^{115}
gamma reactions (γ, n), (γ, γ'), and ($\gamma, 2n$), cross sections for, 7: 3591(J)
gyromagnetic ratios and nuclear magnetic moments, 7: 2128(J)
isomeric state from In^{118} (γ, γ') reaction, 7: 3591(J)
- Indium isotopes In^{116}
half life, 7: 2118, 2688(J)
- Indium-thallium alloys
diffusionless phase changes in, 7: 2305(R)
- Inertia pumps
design and performance, 7: 2550
- Infections
(See also specific bacteria, diseases, organs, etc.; see also Septicemia.)
effects of whole-body radiation on response of antibodies in mice, 7: 2224
effects on lethality following radiation injuries in mice, 7: 2740(J)
- Infrared spectra
of organic compounds, use of D_2O as solvent in measurement of, 7: 3018(J)
- Infrared spectrometers
installation, 7: 2591(R)
- Infusoria
(See Protozoa.)
- Insecticides
(See also specific insecticides.)
metabolism in cockroach, tracer study, 7: 1904
- Insects
(See also specific insects.)
metabolism of pyrethrins in cockroach, tracer study, 7: 1904
- Institute of Industrial Research, Syracuse Univ.
progress reports on application of strong chelating agents in separation of Th and rare earths, 7: 2769(R)
progress reports on non-electronic dosimeters, 7: 3514(R)
- Institute of Science and Tech., Univ. of Ark.
progress reports on recrystallization of aluminum oxide, 7: 2772(R)
- Insulation
(See Electric insulators; Thermal insulation.)
- Insulin
inactivation by radiation and determination of molecular weight, 7: 1879(J)
- Integrators
(See Radiation detection instruments (ion current type).)
- Intermolecular forces
(See as subheading under specific materials.)
- Internal combustion engines
effects of radiation on, 7: 2940(R)
- Internal conversion
(See also Conversion electrons; see also appropriate subheadings under Beta particles and Gamma radiation.)
angular correlation of pairs in anisotropic emission, 7: 3620(J)
- Intestine
alkaline phosphatase activity of, in adrenalectomized and irradiated rats, 7: 3313(J)
phosphatase activity in, 7: 2946
- Invar
(See Iron-nickel alloys.)
- Iodine
colorimetric determination in Te, 7: 3146
exchange reactions in solution, 7: 2763(R)
metabolism, tracer study, 7: 3296(R)
metabolism by neoplastic thyroid gland, 7: 3297(R)
metabolism by thyroid gland, nutritional factors affecting, 7: 2730(R)
metabolism in experimentally induced thyroid tumors, effect of thiouracil on, 7: 2250(J)
photochemical reactions in solution, 7: 2763(R)
protein-bound in blood serum, determination of, 7: 2960(R)
uptake by thyroid gland, effects of x irradiation on, 7: 1889(J)
- Iodine isotopes
removal of radioactive, from urine, 7: 1910(J)
- Iodine isotopes I^{126}
decay scheme, 7: 2923(J)

- Iodine isotopes I^{127}
nuclear magnetic resonance lines in cubic crystals of KI, 7: 2132(J)
- Iodine isotopes I^{128}
gamma spectra, 7: 3278(J)
- Iodine isotopes I^{131}
decay scheme, analysis with gray-wedge γ spectrometer, 7: 2317(R)
decay scheme, coincidence studies with scintillation spectrometers, 7: 2374(J)
determination in blood, urine, and tissues, clinical methods for, 7: 2974(J)
in diagnosis of thyroid abnormalities with scintigrams, 7: 1907(J)
diagnostic and therapeutic use in thyroid disorders and blood-flow disturbances, 7: 2221(J)
effects of chronic treatment with, on thyroids and gonads in mice, 7: 2963(J)
half life, 7: 2688(J), 3636(R)
measurement of radiation from, in thyroid gland and body fluids, 7: 3538(J)
optimal dose for hyperthyroidism, 7: 3297(R)
preparation of dosages for oral administration, 7: 2454(R)
production from reactor-irradiated Te, methods and apparatus, 7: 3146
- Ion beams
(See also subheadings for beams identified by particles, e.g., Neutron beams; see also Ion sources.)
heavy-particle, review of experiments with, 7: 2157(J)
optics of, in long, high-voltage accelerator tubes, 7: 2665(J)
synchronization of pulsed high-energy, 7: 2159(J)
- Ion complexes
entropy, empirical considerations of, 7: 2579, 2827, 3001
substitution reactions in, mechanism of, 7: 2754
- Ion exchange
(Theoretical reports on equilibria, etc.; see also as subheading under specific materials; see also Adsorption.)
separation of nuclear isomers by, 7: 1949(J)
use of chelates in, 7: 2273
- Ion exchangers
for radioactive waste processing, design, 7: 2317(R)
- Ion gages
(See Ion sources; Vacuum gages.)
- Ion sources
(Covering ions from nonradioactive sources; for radioactive sources see headings identified by emitted radiation, e.g., Alpha sources; see also as subheading under instruments having an ion source component.)
aluminum silicates, effects of minute surface impurities, elevated temperatures, and residual air pressure on ion emission by, 7: 3505(J)
design, 7: 3674(P)
for electromagnet isotopes separator with 10-ma beam, design, 7: 2042(J)
filament life extension in high-intensity, 7: 3501
high-temperature oven for use with Nier-type, in mass spectrometers, 7: 2358
pulsable, design of, 7: 2160(J)
solid thermionic, preparation of, 7: 3144(J)
synchronization of pulsed high-energy ion beams from, apparatus for, 7: 2159(J)
- Ionization
(See also appropriate subheadings under materials ionized and under ionizing agents; see also Electrolytic ionization.)
energy loss of relativistic particles by, 7: 2915(J)
by relativistic particles in polarizable medium, 7: 2174(J)
- Ionization chambers
air-wall thickness required to produce equilibrium in x-irradiated tube, 7: 2322
for alpha counting, design of thin nylon-foil windows for, 7: 3679(P)
calibration of boron, by reactivity measurements, 7: 2861(J)
calibration of Landsverk 0.3 r, 7: 2054
calibration of Naval Medical Center Research Institute Sievert chambers, 7: 2055(R)
design, 7: 3107(R)
extrapolation, design of, 7: 2057(R)
for personnel monitoring, manual on, 7: 2239
for reactor instrumentation, design and operation of neutron-sensitive, 7: 2049
for sounding balloons, design of automatic, 7: 2619(J)
test circuit for pulse, 7: 2592
tissue-equivalent, design and fabrication of, 7: 2610
- Ions
(See also headings for ions by name, e.g., Uranium(IV) ions.)
range-energy relation up to $Z = 14$ in nuclear emulsions, 7: 2673(J)
- Iowa State Univ.
progress reports on polarographic behavior of organic compounds at dropping Hg electrode in non-associated anhydrous solvents, 7: 2495(R)
progress reports on separation of azeotropes by diffusion through glass, 7: 2524(R)
- Iridium
gamma spectra of irradiated, 7: 2454(R)
wires of, reduction in size by electrolysis, 7: 1991
- Iridium isotopes
energy levels following β emission from Os^{188} , 7: 3632(J)
- Iridium-rhodium alloys
wires of, reduction in size by electrolysis, 7: 1991
- Iron
(See also Steel.)
absorption of soft component of cosmic radiation in, 7: 3120(J)
activity coefficients in Fe-Ni alloys, 7: 2568(R)
effects of radiation on thermoelectric potential of, 7: 2418(J)
gamma attenuation by, build-up factors for, 7: 3602
magnetic structure of, neutron-diffraction measurements, 7: 3131(J)
 μ -meson reactions, maximum energy of neutrons from, 7: 2870(J)
metabolism, tracer study, 7: 3296(R)
metabolism by Neurospora, 7: 3298
neutron reactions (n, γ), cross sections for, 7: 2655
neutron reactions (n, γ), γ spectrum and cross section for, 7: 2917(J)
neutron total cross sections, in 3- to 12-Mev region, 7: 2123(J)
neutron transmission, 7: 3107(R)
oxidation, deformation of surface layer during, 7: 2821
pile-activation analysis of high-purity, 7: 2770(J)
quenching action of, on fluorescence of U in NaF phosphors, 7: 3156
radiometric determination, 7: 2800(R)
solubility in Na, Na_2O , and $NaOH$, 7: 3452
spectrophotometric determination in Th and Th compounds, 7: 3008
- Iron-aluminum-titanium alloys
mechanical properties and phase studies, 7: 3459(R)
- Iron(III) chlorides
solvent extraction by isopropyl ether, 7: 3037
- Iron-chromium alloys
oxidation at 800 and 1250°, mechanism of, 7: 2822
- Iron-chromium-titanium alloys
mechanical properties and thermal expansion, 7: 3418
- Iron-cobalt-molybdenum alloys
phase studies at 1200°C, 7: 2561
- Iron compounds
fine structure near x-ray absorption edges, 7: 2319
- Iron(II) ions
x-ray-induced oxidation in H_2SO_4 solutions, 7: 2777
- Iron isotopes Fe^{56}
atomic orbital electron ejection accompanying K capture in, 7: 2679(J)
beta and γ emission and internal bremsstrahlung, 7: 3283(J)
- Iron isotopes Fe^{56}
neutron reactions (n, α), existence and cross section of, 7: 3222(J)
- Iron isotopes Fe^{57}
nuclear magnetic moment, 7: 3578(J)
- Iron-molybdenum-nickel alloys
phase studies at 1200°C, 7: 2561
- Iron-nickel alloys
atomic magnetic moments, 7: 2873(R)
- Iron-niobium alloys
activation analysis for Ta, 7: 3368(J)
- Iron pyrites
(See Pyrites.)
- Iron silicates
electric conductivity, 7: 3101(R)
- Iron(II) sulfates
oxidation in acid solution by Po α particles, 7: 3031(J)
oxidation in H_2BO_3 and in Li_2SO_4 solutions by thermal neutrons, 7: 2518
radical yield ratio of ionizing radiation in aqueous solutions of, 7: 2176
- Iron(III) sulfates
dissociation, ion exchange and spectrophotometric study of, 7: 3049
- Iron-titanium alloys
welds in, ductility, 7: 3447(R)
- Irradiation techniques
(See also Radiotherapy.)
device for irradiating O rings under mechanical stress, 7: 3614(R)
- Isomers
(See Chemical isomerism; Nuclear isomers.)
- Isopropyl ether
solvent extraction of $FeCl_3$ by, 7: 3037
- Isotope separation methods
bibliography on, 7: 3148

Isotope separation methods (Cont'd)

- (See also appropriate subheadings under the isotopes of the elements.)
 chemical exchange in thermal diffusion columns, 7: 2272(R)
 diffusion-distillation process, theory and design of equipment for, 7: 2847(R)
 distillation, theory of, 7: 2527(J)

Isotopes

- (See also specific isotopes; see also Radioisotopes; Tracer techniques.)
 availability of electromagnetically separated, 7: 2597
 masses of graph of nuclide energy valley from, 7: 3192(J)
 periodic table of, 7: 2354(J)

Isotopic chemical effects

- (See as subheading under specific materials.)

Isotopic exchange

- (See also appropriate subheadings under specific isotopes; see also Isotope separation methods; Isotopes.)
 bibliography on, 7: 3148
 kinetics and catalysis of, 7: 2272(R)

J

JEEP reactor

- effects of delayed photoneutrons from fission-product γ rays acting on moderator on, 7: 3217(J)
 fuel rod corrosion, inspection of, 7: 3582
 neutron flux distribution in, after shutdown, 7: 2396
 reactivity and neutron flux distribution in, 7: 3581

Jet engines

- (See Turbojet engines.)

Jet pumps

- mercury diffusion, design and performance, 7: 3074

Johns Hopkins Univ.

- progress reports on behavior of institutional incinerators when used to burn radioactive waste, 7: 3061(R)
 progress reports on radioactive contamination and decontamination tests on rubber gloves, 7: 2738(R)

Journal bearings

- design, performance, and lubrication aspects of, 7: 1974(R)

K

K-capture

- (See Electron capture.)

Kappa particles

- (See Mesons (κ).)

Keto acids

- (See Oxo acids.)

Kidneys

- alkaline phosphatase activity of, in adrenalectomized and irradiated rats, 7: 3313(J)
 effects of lethal total-body x irradiation on phosphate distribution, glycogen and sulphydryl content, Na-K distribution, water content, and cytochrome oxidase activity of, in rats, 7: 1868
 morphology of, electron microscope studies, 7: 2727(R)
 pathological effects of U^{235} and U^{238} on, 7: 2745
 radiation injury of, 7: 2468(J)

Klystrons

- (See Electron tubes.)

Kougarok Area (Alaska)

- geology, mineralogy, and exploration, 7: 3440

Krypton

- energy loss distribution of 1.3-Mev electrons in, 7: 2906(J)
 ionization probability curves for, 7: 2047(J)

Krypton isotopes

- beta decay, average charge of daughter from, 7: 3107(R)

Krypton isotopes Kr^{86}

- nuclear energy levels, 7: 2925(J)

Krypton isotopes Kr^{82}

- energy levels, 7: 3260

Kuskokwim Region (Alaska)

- prospecting, 7: 3084

L

L-capture

- (See Electron capture.)

La Veta Prospect (Utah)

- geology, mineralogy, uranium distribution, and exploration, 7: 3077(R)

Labeled compounds

- (For information on the synthesis of labeled compounds and those properties and processes affected by labeling see under main headings for the specific compounds and classes of compounds.)

Laboratories for Research and Development, Franklin Inst.

- progress reports on chemical systems sensitive to radiation, 7: 3390(R)

Laboratory equipment

- (This does not include plant-scale equipment; see also Remote-control equipment; Servomechanisms.)
 animal board for restraining swine, design of, 7: 2729(R)
 continuous microorganism culture apparatus with drop-counting apparatus, design, 7: 2728(R)

Laboratory for Nuclear Science, Mass. Inst. of Tech.

- progress reports, 7: 3464(R)

Lactases

- effects of x radiation on formation of, in E. coli, 7: 3321(J)

Lactose

- metabolism by L. bulgaricus strain Gere A, 7: 3299

Laminar flow

- (See Fluid flow (laminar).)

Lamont Geological Observatory, Columbia Univ.

- progress reports on natural C^{14} measurement, 7: 3429(R)

Lanthanides

- (See Rare earths.)

Lanthanum

- absorption of D_2 by, structure changes during, 7: 3017(J)
 crystal structure and superconductivity of, 7: 3356(J)
 electric properties, 7: 2318(R)
 electrochromatographic separation, 7: 1955(J)
 ion-exchange separation, 7: 2784(J)
 purification by de Boer process, 7: 2810
 tissue distribution and its potential significance in cancer therapy, 7: 2480(R)

Lanthanum ferricyanides

- high-field conductance of aqueous, 7: 3396(J)

Lanthanum hydrides

- crystal structure of deuterated, 7: 3017(J)

Lanthanum isotopes

- in tumor therapy, 7: 2480(R)

Lanthanum isotopes La^{140}

- internal conversion, K/L+M ratios, 7: 2694(J)

Lanthanum oxide-uranium oxide systems

- phase studies, 7: 2536(J)

Lattices

- (For studies on crystalline materials see headings in the form Graphite crystals; see Crystal structure; for studies on reactor lattices see appropriate subheadings under Reactors and under specific reactors by name.)

Lauric acid

- absorption by barium sulfate, 7: 2800(R)

Leaching

- (See as subheading under materials leached.)

Lead

- absorption of soft component of cosmic radiation in, 7: 3120(J)
 cosmic-ray interactions in, measurement in 10^{12} to 10^{14} -ev region, 7: 3117
 gamma attenuation by, build-up factors for, 7: 3602
 gamma backscattering, 7: 2896
 gamma cross sections measured by photon-difference method, 7: 3246(J)
 interlocking blocks of concrete and, for radiation shielding, 7: 2697(J)
 meson reactions, knock-on electrons produced by, 7: 3176(J)
 meson reactions (μ^- , γ), cloud chamber studies, 7: 2633(J)
 μ^+ -meson lifetime in, 7: 2379(J)
 π -meson production by cosmic rays in, 7: 2833(J)
 neutron production by cosmic rays in, as function of latitude and altitude, 7: 3123(J)
 neutron reactions (n , γ), cross sections for, 7: 2655
 neutron total cross sections, 7: 3205(J)
 neutron total cross sections for 14-Mev neutrons, 7: 2871(J)
 neutron total cross sections from 3 to 12 Mev, 7: 2123(J)
 neutron total cross sections from 30 to 153 Mev, 7: 3206(J)
 pair production cross sections at 1.33 and 2.82 Mev, 7: 2130(J)
 penetrating cosmic showers under rates of occurrence of, 7: 3122(J)
 proton reactions (p , n), energy distribution of neutrons from, 7: 3596(J)
 self-diffusion coefficient in Ag-Pb alloys, 7: 3456(R)
 spectrophotometric determination with HCl, 7: 3363(J)
 Lead (liquid)
 neutron diffraction and atomic distribution in, 7: 2337(J)
 testing of electromagnetic pump with, 7: 2809(R)

- Lead-bismuth alloys (liquid)
effects of wetting on heat transfer characteristics of, 7: 3412
flowmetering, 7: 2548
stress-rupture and corrosion of type 347 stainless steel in, 7: 2566(R)
- Lead chlorides
crystal growth from solution, 7: 2263(R)
solubility in various molal concentrations of NaCl, HCl, and HClO₄, 7: 3000
- Lead complexes
with tropolone, chemical stability, 7: 2788
- Lead isotopes Pb²⁰⁶
deuteron reactions (d,p) and (d,t), analysis of proton and triton spectra, 7: 2406(J)
- Lead isotopes Pb²⁰⁷
chemical separation from Bi²⁰⁷, 7: 2873(R)
deuteron reactions (d,p) and (d,t), analysis of proton and triton spectra, 7: 2406(J)
- Lead isotopes Pb²⁰⁸
deuteron reactions (d,p) and (d,t), analysis of proton and triton spectra, 7: 2406(J)
- Lead isotopes Pb²¹⁰
absorption by blood corpuscles and plasma, 7: 2254(J)
beta spectrum, contribution of electron binding energy to, 7: 3623(J)
gamma and x-ray spectra of, 7: 3619(J)
- Lead isotopes Pb²¹²
absorption by blood corpuscles and plasma, 7: 2254(J)
beta spectra, 7: 2862(J)
half life, 7: 2693(J)
- Lead isotopes Pb²¹⁴
nuclear energy levels, γ -ray cascades in, 7: 3280(J)
- Lead poisoning
therapy with Ca ethylenediaminetetraacetate, case histories and dosage schedule, 7: 2245
therapy with (ethylenediamine)tetraacetic acid, casein hydrolysate, pectin, and a copolymer of methylvinyl ether and maleic anhydride, 7: 3337(J)
- Lead-zirconium alloys
crystal structure and phase studies, 7: 2773(J)
- Leak detectors
method for testing jacketed body for airtightness, 7: 3669(P)
- Leaks
(For variable "leaks" see Valves.)
- Lehigh Univ.
progress reports on stress-rupture and corrosion of stainless steel in liquid Bi-Pb alloy, 7: 2566(R)
- Lenses
(See Electromagnetic lenses; see instruments using optical systems.)
- Leptons
interactions involving a de Broglie field, statistical, 7: 3287(J)
- Lethal dosage determinations
(See as subheading under specific radiations and materials.)
- Leucine
synthesis of C¹⁴-labeled, 7: 3404
- Leukemia
effects on nucleoproteins of mouse spleen, 7: 3297(R)
therapy with P³², 7: 2482(J)
therapy with P³², case histories, 7: 3335(J)
- Level indicators
for heavy water level in reactors and other uses, design, 7: 2034(J)
- Lignin
methoxyl C in, barley, origin of, 7: 1959
- Linear accelerators
(For belt-type electrostatic generators see also Van de Graaff accelerators; see also Cockcroft-Walton accelerators.)
beam area in, alternating gradient lenses for reducing, 7: 3231
beam focusing, 7: 3600
beam focusing, divided drift tube for, 7: 3229
defocusing in helix-type, correction of, 7: 2411(J)
for electrons, of 3 to 4 Mev, design, 7: 3232(J)
electrostatic focusing, 7: 2025(J)
focusing improvement in, by applying electric fields to drift tubes, 7: 2161(J)
helical type, stabilization and radiofrequency system for, 7: 3598
instability and radiation hazards of, methods of elimination, 7: 2638(R)
traveling-wave 10-Mev electron, for x-ray therapy, 7: 2412(J)
- Linoleic acid
radioinduced autooxidation of, 7: 3394
- Linoleic acid, methyl ester
protective effect against x radiation in rats, 7: 2241(J)
- Lipids
(See also Fatty acids; Phosphatides; Sterols.)
chromatographic separation in blood plasma, 7: 3042
metabolism, measurement by absorption of methyl β -eleostearate, 7: 1865
- Liquefaction
(See as subheading under specific materials.)
- Liquid drop models
(See Nuclear models (drop).)
- Liquid metals
(See Metals (liquid).)
- Liquids
(The liquid states of normally solid materials are indexed in the form Metals (liquid).)
thermal conductivity of, transient method for determining, 7: 3064
- Lithium
determination in Al-Li-Mg alloys using flame photometer, 7: 3369(J)
proton reactions (p,n), energy distribution of neutrons from, 7: 2142(J), 3596(J)
vapor pressure between 462 and 642°C, 7: 2829
- Lithium (liquid)
circulation system for, design for corrosion studies, 7: 2295
corrosive effects on stainless steel, 7: 2303
metal transport by, in Cr-Ni stainless alloy systems, 7: 2295
- Lithium-aluminum-magnesium alloys
analysis for Li, using flame photometer, 7: 3369(J)
- Lithium antimonides
photoelectric properties, 7: 3498(R)
- Lithium chloride-potassium chloride systems (liquid)
corrosive effects on Ti, 7: 3092(R)
- Lithium chloride-sodium chloride systems (liquid)
decomposition potential, 7: 3101(R)
- Lithium chlorides
absorption from organic solvents onto anion exchange resins, 7: 3045(J)
hydration in nonaqueous solvents, 7: 1912
- Lithium chlorides (liquid)
corrosive effects on Ti, 7: 3092(R)
- Lithium deuterides
proton reactions (p,n), 7: 3603
- Lithium fluoride crystals
radiation damage to, x-ray-diffraction methods for evaluating, 7: 2177(R)
- Lithium iodide crystals
activated with Sn, use in slow-neutron scintillation detector, 7: 2362
- Lithium isotopes
mass, 7: 3150(J)
separation by chemical exchange in thermal diffusion columns, 7: 2272(R)
- Lithium isotopes Li⁶
spin of compound state formed by deuteron bombardment of He³, 7: 3597(J)
- Lithium isotopes Li⁶
deuteron reactions (d,p), angular correlation, 7: 2902(J)
energy levels, deuteron scattering, and proton scattering of, 7: 3466(R)
gamma reactions (γ ,d), cross section and energy levels, 7: 2886(J)
gamma reactions (γ ,d), selection rule for, 7: 2152(J)
helium (He³) nucleus reactions, 7: 2009(R)
neutron reactions (n, α), angular distributions, 7: 3218
nuclear binding energy, theory of, 7: 3208(J)
nuclear spins by intermediate-coupling approximation, 7: 3576(J)
- Lithium isotopes Li⁷
deuteron reactions (d, α), excited states of He⁶ formed in, 7: 2885(J)
gamma reactions (γ , α T), cross sections as function of energy, 7: 3592(J)
gamma reactions (γ ,p) and (γ ,t), excitation functions for up to 24 Mev, 7: 2400(J)
helium (He³) nucleus reactions, 7: 2873(R)
neutron transmission, 7: 3107(R)
nuclear reactions (p, γ), (t, α) and (d,n), angular distribution, 7: 2140(J)
- Lithium isotopes Li⁶
decay of, β - α angular correlation in, 7: 2408(J)
half life, 7: 2695(J)
- Liver
cytological effects of partial hepatectomy on, 7: 1858
cytological effects of x radiation on, in mice, 7: 1867
effects of lethal total-body x irradiation on phosphate distribution, glycogen and sulfhydryl content, Na-K distribution, water content, and cytochrome oxidase activity of, in rats, 7: 1868
effects of radiation on lipid and vitamin-A content of, 7: 3307(J)
effects of whole-body x irradiation on glycogen utilization by, 7: 1893(J)

- Liver (Cont'd)**
 histochemistry of regenerating mouse, **7: 1859**
 preferential incorporation of H isotopes in, **7: 2948(J)**
 response to partial hepatectomy, in mice, **7: 1860**
 role in cholesterol synthesis, tracer studies, **7: 1903**
 scintigrams of, use of colloidal Au¹⁹⁸ in obtaining, **7: 3345(J)**
- Low cost reactor**
 control-system design for, **7: 2138(J)**
- Low-temperature physics**
 (See Cryogenics.)
- Lower Yukon Area (Alaska)**
 prospecting and geology, **7: 3084**
- Lubricants**
 (See also Greases; Oils.)
 container for, for bombarding in cyclotron to study radiation effects on, **7: 3613(J)**
- Luminescence**
 (See also Fluorescence; Phosphorescence.)
 induced by α -particles in air, glass, and quartz, **7: 2419(J)**
- Lungs**
 distribution and pathological effects of colloidal Au¹⁹⁸ after tracheal instillation, **7: 2736(J)**
 edema produced by air blast and epinephrine in, chemical prophylaxis, **7: 2732**
 effects of high explosive blast on, in mice and rats, **7: 3300**
 radiation injuries to, following irradiation of thorax, **7: 2233(J)**
 radiation injuries to, from x-ray therapy of Hodgkin's disease, **7: 1885(J)**
 radon particle distribution in, in rats, **7: 2961**
 retention and pathological effects of inhaled Be, in rats and guinea pigs, **7: 2976**
- Lutetium isotopes Lu¹⁷⁶**
 beta spectra and half life, **7: 3509**
- Lutidines**
 miscibility with D₂O, **7: 1932(J)**
- Lymphocytes**
 incidence of abnormal, in rabbits during and after x irradiation, **7: 1869**
 structural modifications in irradiated human, **7: 2469(J)**

M

- M capture**
 (See Electron capture.)
- Magnesia**
 (See Magnesium oxides.)
- Magnesium**
 corrosion, effect of non-metallic and alkali metal impurities on, **7: 1990(R)**
 purification by vacuum sublimation, **7: 1990(R)**
- Magnesium alloys**
 corrosion, **7: 1990(R)**
 liquidus determinations of polynary, **7: 2814(R)**
 melting and casting, quality control in, **7: 2573(J)**
- Magnesium-aluminum alloys**
 weldments, factors determining performance of, **7: 2572(J)**
- Magnesium-aluminum-copper alloys**
 recovery in artificially aged, **7: 2309(J)**
 structural changes during aging, **7: 2310(J)**
- Magnesium-aluminum-lithium alloys**
 analysis for Li using flame photometer, **7: 3369(J)**
- Magnesium-aluminum-zinc alloys**
 effects of cold work on microstructure and corrosion resistance of, **7: 2001(J)**
- Magnesium-cerium alloys**
 creep at 250 and 300°C, effect of additions on, **7: 2000(J)**
- Magnesium complexes**
 with tropolone, chemical stability, **7: 2788**
- Magnesium ferrites**
 crystal structure, neutron diffraction study of, **7: 2387**
- Magnesium isotopes Mg²⁴**
 deuteron reactions (d,p), angular distributions, **7: 2907(J)**
 energy levels, **7: 2141(J)**
 proton reactions (p, γ), **7: 2141(J)**
 proton reactions (p, γ), resonant energies for, **7: 2889(J)**
- Magnesium isotopes Mg²⁶**
 deuteron reactions (d,p), angular distributions, **7: 2907(J)**
 spin and parity assignments and energy levels of, from Mg²⁴(d,p) reaction, **7: 2907(J)**
- Magnesium isotopes Mg²⁸**
 decay schemes of lower excited states of, from Na²³(α ,p γ), **7: 3617(J)**
 deuteron reactions (d,p), angular distributions, **7: 2907(J)**
- Magnesium isotopes Mg²⁸ (Cont'd)**
 proton reactions (p, γ), **7: 2141(J)**
 proton reactions (p, γ), resonant energies for, **7: 2889(J)**
- Magnesium isotopes Mg²⁷**
 half-life, **7: 2391(J)**, **2688(J)**
 spin and parity assignments and energy levels of, from Mg²⁶(d,p), **7: 2907(J)**
- Magnesium isotopes Mg²⁸**
 formation from proton bombardment of Cl₂, **7: 2687(J)**
 formation from Si³⁰(γ ,2p) and Mg²⁸(α ,2p), **7: 2149(J)**
- Magnesium Labs., Dow Chemical Co.**
 progress reports on liquidus determinations of polynary Mg alloys, **7: 2814(R)**
- Magnesium oxide crucibles**
 properties and fabrication, **7: 3076**
- Magnesium oxides**
 ball milling, **7: 1980(J)**
- Magnesium titanates**
 x-ray spectra, **7: 2933(R)**
- Magnetic fields**
 (Including magnetic lenses, flux measurements, etc.; see also Subheading under the specific device; see also Electric fields; Electromagnetic fields.)
 annular correction for magnetic lens, **7: 3523(J)**
 control, **7: 3141(R)**
 coordinate transformations and solid-angle jacobian for charged particles in, **7: 3285**
 electron motion in homogeneous, and weak periodic electric fields, **7: 2344(J)**
- Magnetic lenses**
 (See Electromagnetic lenses; Magnetic fields.)
- Magnetic recording systems**
 design and testing, **7: 2590(R)**
- Magnetic resonance**
 (See also Subheading under specific materials.)
 detection using double magnetic-field modulation, **7: 2856**
- Magnetic susceptibility**
 measurement in metals and alloys, design of apparatus for, **7: 3454(R)**
- Magnetism**
 theory, **7: 2429(R)**, **3550(R)**
- Magnets**
 for paramagnetic resonance studies, design, **7: 2590(R)**
 stabilization against line voltage changes, method for, **7: 2353(J)**
- Magnetrons**
 (See Electron tubes.)
- Maize**
 radioinduced ring chromosomes in, **7: 3311(J)**
- Maleic acid, derivatives**
 thorium complexes of maleates, **7: 3003(J)**
- Malonic acid, derivatives**
 thorium complexes of malonates, **7: 3003(J)**
- Man**
 lethal radiation dosage (LD_{50/30}) for, calculation of, **7: 2476(J)**
 normal radioactivity in, **7: 3323**
- Manganese**
 equilibrium of (II), (III), and (VI) ions in iodic acid, **7: 2496**
 magnetic structure, neutron-diffraction measurements of, **7: 3131(J)**
 welds of, ductility, **7: 3447(R)**
- Manganese-aluminum-titanium alloys**
 mechanical properties and thermal expansion, **7: 3418**
- Manganese-carbon-titanium systems**
 constitution diagrams, **7: 3461**
- Manganese compounds**
 fine structure near x-ray absorption edges, **7: 2319**
- Manganese(II) fluorides**
 neutron scattering cross sections, **7: 2169(J)**
- Manganese isotopes Mn⁵⁶**
 half life, **7: 2688(J)**
- Manganese-nickel compounds (intermetallic)**
 atomic magnetic moments, **7: 2873(R)**
- Manganese-nitrogen-titanium systems**
 constitution diagrams, **7: 3461**
- Manganese oxides**
 neutron scattering cross sections, **7: 2169(J)**
- Manganese-titanium alloys**
 mechanism of martensitic transformation in, **7: 1993**
- Manometers**
 (See also Vacuum gages.)
 for measuring very low differential pressures, design, **7: 2841**
- Manuals**
 (See as subheading under specific processes and equipment; see Handbooks and Manuals.)

- Marysvale Area (Utah)
uranium distribution and geochemistry, **7: 3077(R)**
- Mass defect
(See appropriate subheadings under specific isotopes.)
- Mass spectrography
in study of ionic emission of Al silicates, **7: 3505(J)**
- Mass spectrometers
(See also Calutrons; Electromagnetic separation; Ion sources.)
with anastigmatic point focusing, design of, **7: 3149(J)**
correction of angular aberration in, **7: 2044(J)**
design, **7: 3668(P)**
double-focusing Mattauch-type, design, **7: 2046(J)**
gas sample intake for, **7: 2359(J)**
high-temperature oven-type ion source for, **7: 2358**
linear r-f, analysis for small signal operation, **7: 2848(J)**
momentum-type, design, **7: 3150(J)**
precision, review and comparison of, **7: 2598(J)**
relativistic double-focusing for operation with 55-kev electrons, design, **7: 2849(J)**
for separation of light and medium isotopes, design, **7: 2042(J)**
stray magnetic fields in, means of avoiding effects of, **7: 3150(J)**
in study of discharge mechanism in radiation detectors, **7: 2609**
- Massachusetts Inst. of Tech.
(See also headings in the form Laboratory for Nuclear Science, Mass. Inst. of Tech.)
progress reports on boiling heat transfer, **7: 3067(R)**
progress reports on deformation characteristics of Ni-Cr alloy and aging of Ni-Cr alloys hardened with Al and Ti, **7: 2567(R)**
progress reports on fundamentals of cold working and recrystallization, **7: 2815(R)**
progress reports on measurement of thermal conductivity of refractory materials, **7: 3100(R)**
progress reports on metal-ceramic interactions at elevated temperatures, **7: 3099(R)**
progress reports on solid solutions and grain boundaries, **7: 2816(R)**
progress reports on x-ray study of radiation damage, **7: 2177(R)**
- Materials testing
(See also the specific material or equipment concerned or properties being tested.)
apparatus for study of effects of cyclic thermal stresses in ductile metals, **7: 2029**
- Materials testing reactor
personnel organization and staffing of project, **7: 2455(J)**
- Mathematics
(Including statistics; see also specific problem for application of mathematics; see also specific mathematical methods, e.g., Monte Carlo method; See also Computers; Perturbation theory.)
bounded degenerate perturbations of operators in Hilbert space, **7: 3506**
diagonal representation of maximal normal operators for quantum mechanics, **7: 2850**
formula for solid angle subtended by finite radiation detector and point source, **7: 2612**
rotational transforms, some properties of, **7: 3153**
Schwarz triangle functions, **7: 2600**
solution of integral equations in neutron diffusion theory, **7: 2101**
- Melamine, triethylene-
effects on developing nervous system, **7: 3302**
- Melting
(See appropriate subheadings under materials.)
- Melting point apparatus
for titanium alloys, design, **7: 3103**
- Melting points
(See as subheading under specific materials.)
- Mercaptans
(See Thiols.)
- Mercapto group
radiosensitivity effects, **7: 2737**
- Mercury
effect of wetting on heat transfer characteristics of, **7: 3412**
heat transfer by turbulent flow of, in pipes, **7: 3069**
neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, **7: 2875**
neutron total cross sections for 14-Mev neutrons, **7: 2871(J)**
toxicity and handling of, **7: 2246**
vapor, d-c portable detector for, **7: 1967**
- Mercury chlorides
diffusion in n-butanol, effect of pressure on, **7: 2988**
electric quadrupole resonance of Cl in HgCl₂, **7: 3203(J)**
nuclear quadrupole resonance in, **7: 2393(J)**
- Mercury electrodes
polarographic studies with, **7: 3465(R)**
- Mercury isotopes
electromagnetic concentration of stable, **7: 2355**
- Mercury isotopes Hg¹⁹³
decay schemes and half life, **7: 2399**
- Mercury isotopes Hg¹⁹⁶
decay schemes, **7: 2399**
- Mercury isotopes Hg¹⁹⁸
K Auger electron yields of, from Au¹⁹⁸, **7: 2186(J)**
nuclear energy levels, **7: 3263(J)**
nuclear energy levels and spins, **7: 3627(J)**
- Mercury isotopes Hg¹⁹⁹
nuclear orientation by polarized light, **7: 3115(J)**
- Mercury isotopes Hg²⁰²
photochemical enrichment of, **7: 2357(J)**
- Mercury(II) nitrates
diffusion in aqueous solutions, effect of pressure on, **7: 2988**
- Mesic atoms
electron ejection in formation of, **7: 2381(J)**
- Meson decay
selection rules for, by gage-invariant expansion theorem, **7: 3646(J)**
- Meson reactions
(See as subheading under material acted upon.)
- Meson theory
(See Nuclear theory.)
- Mesons
(See also Cosmic mesons.)
interactions with nucleons, theory, **7: 2091(J)**
knock-on electrons produced in lead by, as function of Pb thickness, **7: 3176(J)**
linear wave equation for, in de Sitter space, **7: 3653(J)**
mass spectra of, application of subtractive field theory to, **7: 2094(J)**
masses of cohesive, for corresponding masses of heavy nucleons, **7: 3177(J)**
production and properties, summary of conference discussions on, **7: 2108(J)**
production and scattering in complex nuclei, **7: 2170(J)**
production by high-energy nucleon collisions, **7: 2865(J)**
production by high-energy nucleon-nucleon collisions, theory, **7: 2089(J)**
pseudoscalar, production by nucleon-nucleon collisions, **7: 2434(J)**
quaternion approach to meson theory, **7: 2435(J)**
scattering by nucleons, graphical method for obtaining phase shifts from experimental data on, **7: 3188(R)**
thermodynamics of interactions of ensembles of, with their source, **7: 2431(J)**
Tomonaga approximation applied to "intermediate" coupling of, with nucleons, **7: 3643(J)**
- Mesons (κ)
emission in nucleon collisions, probability of, **7: 2378(J)**
formation in cosmic-ray stars, **7: 2090(J)**, **2630(J)**
mass, **7: 2630(J)**
mass, photoelectric determination of, **7: 3545(J)**
production in nuclear emulsions, **7: 3544(J)**
- Mesons (μ)
atomic capture of, ejection of electrons in, **7: 2381(J)**
Fermi-type interaction of, theory, **7: 2212(J)**
interactions, energy spectrum of knock-on electrons from, **7: 3543(J)**
range distribution of, from π -meson decay, **7: 3541(J)**
reactions with nucleons, production of π mesons from, **7: 3484(J)**
specific ionization by high-energy, **7: 2380(J)**
spin, theoretical predictions from Rarita-Schwinger equation for spin- $\frac{1}{2}$ particle, **7: 2199**
- Mesons (μ^-)
capture, radiative transitions associated with, **7: 2864**
capture in nuclear emulsions, **7: 2869(J)**
decay, electrons associated with, **7: 3182(J)**
fission of U by, **7: 3174**
spontaneous decay of, theory, **7: 2095(J)**
- Mesons (μ^+)
lifetimes in Pb and paraffin, **7: 2379(J)**
- Mesons (π)
absorption, scattering, and production in nuclei, **7: 2866(J)**
charge-exchange scattering of 40-Mev, in H and D, **7: 2087**
decay, range distribution of μ mesons from, **7: 3541(J)**
decay schemes, examination by general invariance principles and charge-independence hypothesis, **7: 3655(J)**
interactions with particles, S-matrix method in study of, **7: 2093(J)**
photoproduction, damping corrections in, **7: 2868(J)**
photoproduction from H and C, **7: 3465(R)**
production, **7: 2578(R)**
production by μ -meson reaction with nucleons, **7: 3484(J)**
production by neutron bombardment of O₂, **7: 2088**

Mesons (π) (Cont'd)

- production by p-n interactions, 7: 3603
- production in nuclear collisions, behavior of tensor operators in isotopic spin space, 7: 3189(R)
- production in penetrating showers under C, Al, H, and Pb, 7: 3122(J)
- scattering by deuterons, cross section calculation by impulse approximation, 7: 3179(J)
- scattering by H, cross section for, 7: 2911(J)
- scattering by nucleons, charge independence in, 7: 2122
- scattering by nucleons, theory, 7: 2109(J)

Mesons (π^-)

- absorption by α particles, theory, 7: 2377
- from $\text{Be}^8(n, \pi^-)$ and $\text{C}^{12}(n, \pi^-)$ reactions, angular distributions, 7: 2628
- fission of U by, 7: 3174
- scattering by deuterons, 7: 2897
- scattering by protons, coulomb interference effects in, 7: 3190(R)

Mesons (π^0)

- angular distribution of, from $n + p \rightarrow d + \pi^0$ reaction, 7: 2631(J)
- decay schemes, 7: 2096(J)
- production by photon-proton interactions, 7: 3175(J)
- production by reactions on deuterium, 7: 3180(J)
- yields from proton reactions, atomic number dependence of, 7: 2632(J)

Mesons (π^+)

- scattering by protons, coulomb interference effects in, 7: 3190(R)

Mesons (τ)

- decay schemes, 7: 3181(J)
- mass, 7: 2629(J)
- production in ice, 7: 3181(J)

Mesons (χ)

- production in cosmic-ray stars, 7: 2090(J)
- production in nuclear emulsions, 7: 3544(J)

Metabolism

- (See as subheading under specific materials and organisms; see also Animal metabolism; Plant metabolism.)

- of carbon in mice, effects of radiation on, 7: 2235(J)
- effects of dosage size on distribution of radioisotopes in the body, 7: 2985(J)
- effects of excessive dietary Zn on liver enzymes, in rats, 7: 2975
- effects of neutrons, trypanflavine, and plant extracts on cellular, 7: 1886(J)
- of E. coli, effects of radiation on, 7: 3315(J)
- of iodine by thyroid gland, nutritional factors affecting, 7: 2730(R)
- of lipids, measurement by absorption of methyl β -eleostearate, 7: 1865
- of radioisotopes in living organisms, hydrodynamic model for, 7: 2984(J)

Metabolism cages

- for radioisotope studies with dogs, design, 7: 2490(J)

Metal carbides

- (See Carbides.)

Metal-cermet couples

- interfacial reactions, 7: 3099(R)

Metal chelates

- (See Chelates.)

Metal coatings

- (See also Coatings.)

- preparation, detachable filament connectors for attaching filaments to electrodes in machines used for, 7: 3676(P), 3677(P)

Metal crystals

- lattice dynamics, sound transmission, and atomic heat of, theory, 7: 2019

Metal foil detectors

- measurement of neutron flux by, 7: 3169(J)
- uranium, use in reactor neutron flux measurements, 7: 3258

Metal ions

- (See Ions.)

Metal-metal oxide systems

- (See Cermets.)

Metal oxides

- (See Oxides.)

Metallurgical Advisory Committee on Titanium

- progress reports on Ti research and development, 7: 1997(R)

Metallurgical Labs., Dow Chemical Co.

- progress reports on preparation and corrosion of high purity Mg, 7: 1990(R)

Metallurgy conferences

- on powder metallurgy in Europe, June 1952, review of papers, 7: 2308

Metals

- (See also specific metals; see also Alloys.)
- creep and tensile properties at elevated temperatures, 7: 3422
- effects of cyclic thermal stresses on, apparatus for study of, 7: 2029
- effects of radiation on crystal structure and mechanical properties, 7: 1989

Metals (Cont'd)

- oxidation, deformation of surface layer during, 7: 2821
- preparation by thermal decomposition of volatile halides, detachable filament connectors for machines using hot-wire method for, 7: 3676(P), 3677(R)
- spectrophotometric determination of heavy, 7: 2255
- strain aging and rheotropic recovery, 7: 3420
- thermal conductivity at liquid H temperature, 7: 2549
- vacuum evaporation, design of heaters for, 7: 2316
- x-ray spectra, theory, 7: 2319

Metals (liquid)

- (See also specific metals and alloys.)
- circulation system for, 7: 3141(R)
- corrosive effects, static tests at 1000°C, 7: 2312(J)
- effects of wetting on heat transfer characteristics of, 7: 3412
- thermodynamic activity of constituents of, determination from solidification diagrams, 7: 3471

Metals Research Lab., Carnegie Inst. of Tech.

- progress reports on electrochemical studies of non-aqueous melts, 7: 3101(R)

Metals Research Lab., Case Inst. of Tech.

- progress reports on mechanical properties of titanium base alloys, 7: 2304(R)

Metamict minerals

- energy balance between formation of, and recrystallization of, 7: 2302(J)

- thermal analysis, 7: 3086(J)

- thermal analysis of betafites, 7: 3085(J)

Metaphosphates

- (See also Phosphates.)

- condensation of PO_3 group in tri-, infrared adsorption study of, 7: 2532

Meteorites

- iron, as cosmic-ray meters, 7: 3124(J)

Meteorology

- (See also as subheading under specific sites, installations, and geographic areas; see also Atmosphere.)
- atmospheric turbulence studies, 7: 3183(R)
- variation of turbulence spectrum with height under superadiabatic conditions, 7: 2099(J)
- wind profiles and shearing stress, 7: 2098(J)

Meters

- (See specific meters.)

Methacrylic acid, methyl ester

- polymerization, β -ray-induced, 7: 3032(J)
- polymerization, radioinduced, 7: 2317(R)

Methane

- energy loss distribution of 1.3-Mev electrons in, 7: 2906(J)
- exchange reactions with atomic D, 7: 3376(J)

Methane, bromo-

- infrared spectrum of CD_3Br , 7: 1934(J)

Methane, diazo-

- synthesis of C^{14} -labeled, 7: 2279(J)

Methane, dibromodifluoro-

- vibrational spectra, potential constants, and thermodynamic properties of, 7: 3401(R)

Methane, dichlorodifluoro-

- condensation in horizontal smooth and ribbed tubes, heat release during, 7: 2288(J)

Methane, iodo-

- photolysis of, gas production in, 7: 2999
- radiolysis, products of, 7: 3029

Methane, tetrafluoro-

- (See Carbon tetrafluoride.)

Methanoic acid

- (See Formic acid.)

Methanol

- permeation through glass, 7: 2524(R)
- synthesis of tritium-labeled, 7: 3296(R)

Methionine

- metabolism by *Torulopsis utilis*, 7: 2978
- transformation into methoxyl groups of lignin in barley, 7: 1959

Methyl alcohol

- (See Methanol.)

Methyl bromide

- (See Methane, bromo-.)

Methyl iodide

- (See Methane, iodo-.)

Methyl methacrylate

- (See Methacrylic acid, methyl ester.)

Methylamine

- synthesis of C^{14} -labeled, 7: 2279(J)

- Mice**
effects of high explosive blast on mechanically constrained, **7: 3300**
Michigan Univ.
(See also Engineering Research Inst., Univ. of Mich.)
progress reports on the high-resolution detection of radiation,
7: 2971(R)
- Microscopes**
radiation microscope for optical scintillation counting, **7: 2971(R)**
- Microstructure**
(See as subheading under specific materials.)
- Microtomes**
for thin sectioning for electron microscopy, design, **7: 2223(J)**
- Microtron**
(See Cyclotrons.)
- Microwave equipment**
(See also Electron tubes.)
automatic standing wave machine, design, **7: 2320(R)**
design, **7: 3499(R)**
- Microwave spectrometers**
high-resolution, design of, **7: 2320(R)**
- Microwaves**
interaction of, propagated through a gaseous discharge plasma,
7: 3184(J)
transmission systems, design and performance, **7: 2590(R)**
- Miller House Area (Alaska)**
prospecting for Th and U, **7: 2801**
- Mineral metabolism**
(See as subheading under specific organisms.)
- Minerals**
(See also specific minerals; see also Radioactive minerals.)
age estimations, suitability of Sr isotopes in determination of,
7: 2040(J)
age estimations by $K^{40}-A^{40}$ method, **7: 3444(J)**
flotation studies of, **7: 2800(R)**
identification of, containing Ta, Nb, Ti and U, **7: 3435(R)**
- Minnesota Univ.**
progress reports on U occurrence in asphaltite, **7: 3433(R)**
- Missouri Univ. School of Mines and Metallurgy**
progress reports on electrodeposition of Ti, **7: 3092(R)**
- Mitosis**
(See also appropriate subheadings under specific organisms and under materials causing mitosis; see also Chromosomes; Genetics.)
inhibition of, effects of tetrasodium 2-methyl-1:4-naphthohydroquinone diphosphate alone and combined with x radiation on, **7: 2222(J)**
inhibition by x radiation, factors affecting, **7: 2236(J)**
phosphorus incorporation into chromosomes during, tracer study,
7: 2494(J)
- Models**
(See Nuclear models.)
- Moderators (reactor)**
(See under specific reactors; see specific material used for reactor moderators.)
- Molds**
(See as main heading by material of mold and as subheading under material for which mold is used.)
- Molecular structure**
(See also as subheading under specific materials.)
isotopic shifts in vibration frequencies, formulation in terms of reciprocal kinetic-energy matrix, **7: 3388(J)**
theory, **7: 3550(R)**
theory of electronic, bibliography on, **7: 3549**
- Molecular weights**
measurement by effusion, **7: 2636**
microchemical determination by effusion, apparatus for, **7: 2857**
- Molecules**
electron energy levels, **7: 3550(R)**
energy levels, studies by generalized self-consistent field method,
7: 2429(R)
- Molybdenum**
brazing and ductility of, **7: 3449(R)**
effects of processing variables on transition temperature, strength and ductility of high-purity sintered wrought metal, **7: 2562**
electroplating of Ni coatings on, **7: 3446**
magnetic structure of, neutron-diffraction measurements, **7: 3131(J)**
- Molybdenum-aluminum-titanium alloys**
constitution diagrams and mechanical properties, **7: 3458**
- Molybdenum-iron-nickel alloys**
phase studies at 1200°C, **7: 2561**
- Molybdenum isotopes Mo^{90}**
identification and decay scheme, **7: 2661(J)**
- Molybdenum isotopes Mo^{91}**
decay scheme, **7: 2403(J)**
isomers, search for, **7: 2407(J)**
- Molybdenum isotopes Mo^{92}**
gamma reactions (γ, n), cross sections as function of energy,
7: 2403(J)
mass difference of Zr⁹² and, **7: 2045(J)**
neutron reactions ($n, 2n$), isomeric branching and threshold behavior of,
7: 2407(J)
- Molybdenum isotopes Mo^{93}**
isomeric state of, assignment of 6.7-hr activity to, **7: 2194(J)**
isomeric transition and nuclear spin of, **7: 2119**
mass assignment of, from Nb⁹² (d, n) reaction, **7: 2660(J)**
- Molybdenum isotopes Mo^{94}**
mass difference of Zr⁹⁴ and, **7: 2045(J)**
- Molybdenum isotopes Mo^{96}**
energy levels, **7: 2185(J)**
mass difference of Zr⁹⁶, Ru⁹⁶, and, **7: 2045(J)**
- Molybdenum isotopes Mo^{101}**
decay schemes, **7: 3348(R)**
- Molybdenum isotopes Mo^{102}**
decay schemes, **7: 3348(R)**
- Molybdenum oxides**
high-temperature reactions, **7: 2588**
- Molybdenum-titanium alloys**
constitution diagrams and mechanical properties, **7: 3458**
welds of, ductility, **7: 3447(R)**
- Molybdenum-zirconium alloys**
tensile properties of, up to 300°C, **7: 3457(R)**
- Monel metal**
(See Nickel alloys.)
- Monitoring**
(See Radiation monitoring.)
- Monkeys**
accumulation, metabolism, and biological effects of At in, **7: 2720(J)**
- Monomolecular films**
of stearic acid tagged with C¹⁴, use in surface research of various material, **7: 2789(J)**
- Montana**
uranium and thorium occurrence, bibliography on, **7: 3438**
- Montezuma District (Colo.)**
geology, prospecting, and uranium distribution, **7: 3080**
Monument Valley District (Ariz.)
geophysical exploration, **7: 3431**
- Morphology**
(See as subheading under specific organisms.)
- Morrison Formation**
geobotanical prospecting and mineralogy of, **7: 2803**
- Multiplication factor**
(See also as subheading under reactors.)
effects of fast fission on, calculation of, **7: 3216(J)**
measurement by neutron densities, **7: 2652(J)**
- Mutations**
(See also appropriate subheadings under specific organisms.)
radioinduced in Glomerella, genetics and cytology of, **7: 2722**

N

- Nagasaki**
radiation sickness observed in patients within 30 days following atomic explosion at, review of findings, **7: 3330(J)**
- NaK**
(See Potassium-sodium alloys.)
- Naphthalenediol, derivatives**
inhibition of mitosis by, **7: 2222(J)**
- Naphthalenes**
deuterated, Raman spectra of, **7: 3015(J)**
- National Bureau of Standards**
progress reports on fluorine substitution in hydrous silicates and related minerals, **7: 2786(R)**
- Natural waters**
(See Radioactive waters.)
- Naval Research Lab.**
progress reports on thermal properties of NaOH and Li metal,
7: 2553(R)
- Neck**
x-radiation dosage received by tissues of, measurement, **7: 2972**
- Negatrons**
(See Be α particles.)

- Nembutal
(See Pentobarbital sodium.)
- Neodymium
electrochromatographic separation, **7: 1955(J)**
neutron magnetic scattering by, **7: 2873(R)**
- Neodymium ethyl sulfates
specific heat near 1°K, nuclear and electronic contributions to, **7: 3186(J)**
- Neodymium(III) ions
neutron paramagnetic scattering by, **7: 2009(R)**
- Neodymium isotopes
relative abundance and neutron capture cross sections, **7: 3575(J)**
- Neodymium oxide-uranium(IV-VI) oxide systems
phase studies, **7: 2536(J)**
- Neodymium oxides
neutron paramagnetic scattering by Nd₂O₃, **7: 3237(J)**
- Neodymium sulfates
crystal structure determination, relay computer for use in, **7: 2506**
- Neon
energy loss distribution of 1.3-Mev electrons in, **7: 2906(J)**
specific primary ionization by high-energy electrons, **7: 2638(R)**
- Neon isotopes Ne²⁰
deuteron reactions (d,n), **7: 2638(R)**
energy levels of, from α reactions with O¹⁸, **7: 2895**
- Neptunium carbides
preparation of NpC₂, **7: 3407(J)**
- Neptunium isotopes Np²⁴⁰
radiations from, and calculation of binding energy of last neutron for, **7: 3257**
- Neptunium nitrides
preparation of NpN, **7: 3407(J)**
- Neptunium phosphides
preparation of Np₃P₄, **7: 3407(J)**
- Neptunium silicides
preparation of NpSi₂, **7: 3407(J)**
- Neptunyl ions
paramagnetism of, theory, **7: 1963(J)**
- Nerves
calcium transport in crayfish, **7: 1905**
- Nervous system
(See also appropriate subheadings under materials and radiations affecting the nervous system; see also Brain.)
effects of hormones, triethylene melamine, and radiation on developing, **7: 3302**
effects of radiation on adult and embryonic, **7: 2951**
effects of stimulants of central, on response to irradiation, **7: 2729(R)**
response to drugs in prophylaxis of lung edema, **7: 2732**
- Network analyzers
(See Computers.)
- Neurospora
metabolism of Co and Fe by, **7: 3298**
- Neutrinos
detection of, review, **7: 3625(J)**
Fermi-type interaction of, theory, **7: 2212(J)**
interactions involving a de Broglie field, statistical, **7: 3287(J)**
rest mass, inner bremsstrahlung, and magnetic moment of, relation between, **7: 3553**
- Neutron activation analysis
(See Radiometric analysis.)
- Neutron beams
time-of-flight measurements, timing circuit for, **7: 3143(J)**
- Neutron choppers
(See Neutron spectrometers.)
- Neutron cross sections
(See also as subheading under specific materials; see also main and subheadings for specific neutron cross sections.)
conference at Brookhaven Jan. 20 and 21, 1953, on, proceedings of, **7: 3187**
for reactions (n,p), (n, α), and (n,2n) at 14.5 Mev, tables, **7: 2382**
- Neutron-diffraction analysis
of liquid Pb and Bi, **7: 2337(J)**
- Neutron economy
(See as subheading under reactors.)
- Neutron monochromators
for high transmission in subthermal region, design, **7: 2637(J)**
- Neutron sources
pulsable, design of, **7: 2160(J)**
- Neutron spectra
(See also as subheading under specific materials.)
measurement by photographic emulsion method, simplification of, **7: 3594(J)**
measurement with Li-glass-loaded emulsions, **7: 3155**
- Neutron spectrometers
time-of-flight, high-speed rotation in shutter design for, **7: 3476(J)**
time-of-flight mechanical-shutter, design and performance, **7: 3519**
triple-coincidence proton-recoil, design and performance, **7: 3159**
- Neutron total cross sections
(See also as subheading under specific materials.)
calculation of, by potential-well model, **7: 3223(J)**
measurement in 3- to 12-Mev region, **7: 2123(J)**
- Neutrons
(See also Cosmic neutrons; Fast neutrons; Neutron beams; Neutron sources; Thermal neutrons.)
decay of, theory, **7: 2102(J)**
detection, ionization chamber for, **7: 2049**
detection and measurement, discussion at Brookhaven Conference on neutron cross sections, **7: 3187**
detection and measurement by autoradiography of irradiated detectors, **7: 3169(J)**
detection and measurement with chemical radiation detectors, **7: 2050**
deuteron reactions, angular distribution, **7: 2901(J)**
diffusion, solution of integral equations in theory of, **7: 2101**
effects on mitoses in vegetative root tips, **7: 1886(J)**
Fermi-type interaction of, theory, **7: 2212(J)**
magnetic interaction with electrons, spin-spin and spin-orbit contributions to, **7: 3238(J)**
measurement of flux distribution of, thermopile for, **7: 2051**
nuclear transparency to high-energy, diffraction effect illustrating, **7: 3196(J)**
paramagnetic scattering by Nd₂O₃, Er₂O₃ and Pr₂O₃, **7: 3237(J)**
production by capture of μ mesons in Fe, **7: 2870(J)**
production in elements by cosmic radiation, as function of latitude, altitude, and atomic weight, **7: 3123(J)**
proton reactions, γ spectra from, **7: 3226(J)**
proton reactions (p, γ), cross section for 340-Mev, **7: 2409(J)**
proton reactions (p, γ)d, cross section for 200 to 250 Mev, **7: 2401(J)**
proton scattering, calculation of Fermi scattering length in, **7: 3245(J)**
proton scattering, polarization effects in, **7: 2164(J)**
scattering by deuterons, angular distribution and total cross sections of, **7: 2894**
scattering by deuterons, calculation of cross section at 90 Mev by Born approximation, **7: 3610(J)**
scattering by protons, **7: 3603**
scattering by protons, comparison of Born and Heitler expansions, **7: 3556(J)**
scattering by protons in 13.7 and 28.4 Mev region, **7: 2910(J)**
scattering by tritons at 14 Mev, theory, **7: 2905(J)**
scattering of 300-Mev, by protons, **7: 2323**
star production by, angular distribution of particles emitted in, **7: 2370(J), 3227(J)**
synthesis, possibility of, **7: 2103(J)**
- New Hampshire Univ.
progress reports on infrared and ultraviolet spectrum of BrF₃, **7: 2531(R)**
progress reports on preparation and properties of fluorides, **7: 3380(R)**
- New Mexico (McKinley Co.)
geology and geobotanical prospecting in U-bearing areas, **7: 2803**
- New Mexico (Valencia Co.)
geology and geobotanical prospecting in U-bearing areas and geology of, **7: 2803**
- New York Univ.
progress reports on grain size control in Ti, **7: 3460(R)**
progress reports on nature of crystal growth from solution, **7: 2263(R)**
progress reports on treatment of synthetic laundry waste on trickling filters, **7: 1966(R)**
- New York Univ., Coll. of Engineering
progress reports on experimental studies of small scale turbulence, **7: 3546(R)**
- Nichrome
(See Nickel alloys.)
- Nickel
adsorption and solution of H₂ by dispersed, **7: 3048(J)**
alpha reactions, analysis of secondary particles from, **7: 2656**
corrosion by liquid NaOH, **7: 2553(R)**
corrosion by liquid Pb at 1000°C, **7: 2312(J)**
electrochromatographic separation from Cu and Ag, **7: 3036**
helium ion (He³) reactions with, activities produced by, **7: 2887(J)**
neutron transmission, **7: 2873(R)**
oxidation, deformation of surface layer during, **7: 2821**
solvent extraction with thenoyltrifluoroacetone, **7: 2498(R)**
thermal conductivity, **7: 2318(R)**
x-ray spectra, **7: 2319**
- Nickel alloys
creep and stress-rupture of, **7: 2811**

- Nickel-aluminum-chromium-titanium alloys
aging characteristics, 7: 2567(R)
- Nickel-beryllium alloys
effects of radiation on electric conductivity and hardness of, 7: 2306
- Nickel catalysts
deuterization of Raney, 7: 2264(J)
- Nickel-chromium alloys
corrosion by liquid Na at 1000°C, 7: 2312(J)
deformation characteristics of, in creep at elevated temperatures, 7: 2567(R)
- Nickel coatings
electrodeposition on Mo, 7: 3446
- Nickel complexes
hydration in nonaqueous solvents, 7: 1912
with tropolone, chemical stability, 7: 2788
- Nickel compounds
x-ray absorption spectra, 7: 2319
- Nickel-copper alloys
effects of radiation on thermoelectric potential of, 7: 2418(J)
- Nickel-gold alloys
diffuse x-ray scattering, interpretation from powder patterns of solid solutions, 7: 2670
- Nickel-iron-molybdenum alloys
phase studies at 1200°C, 7: 2561
- Nickel isotopes Ni^{62}
neutron transmission, 7: 2873(R)
- Nickel nitrates
absorption from organic solvents on to anion exchange resins, 7: 3045(J)
- Nickel oxides
chemical activity of, influence of disappearance of antiferromagnetism on, 7: 2325
- Nickel-palladium alloys
adsorption and solution of H_2 by dispersed, 7: 3048(J)
- Nickel powders
deuterization of Raney nickel catalysts, 7: 2264(J)
- Niobium
activation analysis of minerals of, for Ta, 7: 3368(J)
chromatographic separation from Ta on activated alumina, 7: 3044(J)
colorimetric determination, effect of tartaric acid concentration in, 7: 2255
magnetic structure of, neutron-diffraction measurements, 7: 3131(J)
- Niobium complexes
with chloride, tartrate, and fluoride, spectra of, 7: 2785
- Niobium-iron alloys
activation analysis for Ta, 7: 3368(J)
- Niobium isotopes Nb^{95}
decay schemes, 7: 2190(J)
gamma emission, 7: 2638(R), 2853
internal conversion, K/L + M ratios, 7: 2694(J)
- Niobium-zirconium alloys
corrosion embrittlement in HCl, 7: 3428(J)
tensile properties of, up to 300°C, 7: 3457(R)
- Nitrates
reduction by *Pseudomonas*, effects of aeration on, 7: 2488
- Nitric acid
exchange of O isotopes between H_2O and, 7: 1960(J)
- Nitriles
radiosensitivity effects on rats, 7: 1897(J)
- Nitrobenzene
(See *Benzene, nitro-*)
- Nitrogen
activities produced in, by N^{+2} ion bombardment of, 7: 2150(J)
neutron scattering by, 7: 2009(R), 2873(R)
physical properties at low temperatures, 7: 2549
- Nitrogen-chromium-titanium systems
constitution diagrams, 7: 3461
- Nitrogen-hydrogen systems
thermal diffusion ratio in, 7: 2346(J)
- Nitrogen ions
triply ionized, nuclear transformation of light nuclei by accelerated, 7: 2150(J)
- Nitrogen isotopes
separation by chemical exchange in thermal diffusion columns, 7: 2272(R)
- Nitrogen isotopes N^{14}
alpha reactions (α, p), angular distributions, 7: 2140(J)
alpha reactions (α, p), energies for, 7: 2662(J)
energy levels, deuteron scattering, and proton scattering of, 7: 3466(R)
energy levels from α bombardment of Be^{10} , 7: 3590(J)
energy levels from C^{13} (p, γ) reaction, 7: 3224(J)
gyromagnetic ratios and nuclear magnetic moments, 7: 2128(J)
- Nitrogen isotopes N^{15}
nuclear magnetic moments, exchange contribution to, 7: 2389(J)
proton reactions (p, α) angular distribution correlation with angular momenta coupling, 7: 2140(J)
- Nitrogen-manganese-titanium systems
constitution diagrams, 7: 3461
- Nitrogen oxides
catalytic decomposition over Cu and Pt, 7: 2760(R)
- Nitrogen-titanium systems
(See also *Titanium nitrides*)
constitution diagrams and mechanical properties, 7: 3103
- Nomenclature
(See as subheading under field of interest; see *Glossaries*.)
- Norleucine
radiation decomposition of C^{14} -labeled, during storage, 7: 3030
synthesis of C^{14} -labeled, 7: 3404
- North Carolina State Coll.
progress reports on measurement of thermal properties of non-metallic materials at high temperatures, 7: 2268(R)
- Norvaline
radiation decomposition of C^{14} -labeled, during storage, 7: 3030
synthesis of C^{14} -labeled, 7: 3404
- Norwegian-Dutch Heavy Water Reactor
(See *JEEP reactor*.)
- Nuclear electric moments
(See also *Nuclear magnetic moments*)
determination from electronic paramagnetic resonance, review, 7: 2646(J)
use in testing shell nuclear models, 7: 2872
- Nuclear emulsions
(See also *Photographic films; Photographic film detectors*)
diffusion of radioelements in, 7: 3517
diffusion of U from uranyl acetate-impregnated silk threads in, 7: 2367(J)
fading of the latent image in, mechanism, 7: 2375(J)
grain density increase in, explanation by nuclear track emulsion model, 7: 3166(J)
handling and development of 100 to 1000 μ thick, 7: 2073(J)
heavy-nuclei tracks in, thickness of, 7: 2066(J)
marking event positions on surface of, device for, 7: 2079(J)
multiple scattering of tracks in, measurement by projection microscope, 7: 2080(J)
nuclear capture of μ^- mesons in, 7: 2869(J)
preparation of Li-glass-loaded, for neutron spectra measurements, 7: 3155
processing, 7: 3513
proton scattering by, 7: 3605(J)
range-energy relations for α particles and deuterons in, 7: 2621(J)
range-energy relations for ions up to $Z = 14$ in, 7: 2673(J)
range-energy relations for particles in, 7: 3249(J)
star production and mean free path of 240-Mev protons in, 7: 2144(J)
star production by 130-Mev protons in, cross sections for, 7: 3608(J)
stripped, techniques of preparation and use of, 7: 3520(J)
for study of high-energy nuclear interactions in Pb and light elements, 7: 3117
in study of nuclear phenomena, review, 7: 2618(J)
- Nuclear induction
dynamical theory of, 7: 2107(J)
- Nuclear isomers
(See also appropriate subheadings under specific isotopes.)
of even-even nuclei, bibliography on, 7: 2643
half lives of short-lived, 7: 3618(J)
separation by ion exchange, 7: 1949(J)
- Nuclear magnetic moments
(See also *Nuclear electric moments*)
electronic paramagnetic resonance, review of, 7: 2646(J)
geometrical solution for, in magnetic fields, 7: 3204(J)
of nuclei with almost closed shells of nucleons, exchange contribution to, 7: 2389(J)
for odd-odd nuclei, computation using extreme jj coupling model, 7: 2874(J)
- Nuclear magnetic resonance
(See also as subheading.)
absorption width in liquids, calculation of, 7: 2134(J)
of aligned radioactive nuclei, measurement, 7: 2390(J)
dependence of signals on r-f field and paramagnetic catalyst, 7: 2133(J)
self-quenched super-regenerative detector for, 7: 2131(J)
separation of intra- and intermolecular contributions to second moment of, 7: 3579(J)
- Nuclear models
application to low levels of even-even nuclei, 7: 3211(J)
calculation of neutron total cross sections by, 7: 3223(J)

Nuclear models (Cont'd)

liquid-drop behavior of an independent-particle model, 7: 2105(J)
uniform, characteristics and modifications, 7: 2112(J)

Nuclear models (collective)

correlation of features of nuclear constitution and interpretation of fission phenomena by, 7: 2705(J)

Nuclear models (drop)

correlation of features of nuclear constitution and interpretation of fission phenomena by, 7: 2705(J)

Nuclear models (shell)

assignment of angular momentum and parity to energy levels of deuterium-bombarded Bi and Pb by, 7: 2406(J)

deformability of nuclei, from shell-model calculations, 7: 3107(R)

effects of collective motion in, on nuclear transitions, 7: 3281(J)

meson-well potential in, 7: 3561(J)

nature of internucleon forces in relation to, 7: 3560(J)

new parameter for, 7: 3195(J)

nuclear magnetic moments of odd-odd nuclei computed from, 7: 2874(J)

nuclear spins in, regularities in, 7: 3193(J)

nuclear spins of Li^6 and B^{10} by intermediate coupling approximation of, 7: 3576(J)

pairing of nucleons in, 7: 3555(J)

prediction for matrix elements for β decay of mirror nuclei from, 7: 3622(J)

tests of, from nuclear quadrupole moment data, 7: 2872

Nuclear models (spheroidal)

deviations from LS coupling in, 7: 2106(J)

Nuclear moments

(See Nuclear electric moments; Nuclear magnetic moments.)

Nuclear particles

(See also specific particles; see also Elementary particles; Nucleons; Radiation.)

collision loss of heavy particles, correction to Bethe-Bloch formula for, 7: 3240(J)

magnetic moments, relativistic corrections to, 7: 2883(J)

polarization, 7: 2873(R)

production of polarized, in nuclear reactions, 7: 2385(J)

relativistic ionizing, energy loss and Cherenkov radiation from, 7: 2674(J)

tensor force interaction between, of almost closed shells and an external nucleon, 7: 2384(J)

Nuclear physics conferences

summaries of papers presented at Univ. of Rochester, Dec. 18-20, 1952, 7: 2108(J)

Nuclear reactions

(See also appropriate subheadings under specific radiations, elements, and isotopes; see also Beta decay; Fission.)

angular correlations in, theory of, 7: 2201(J)

angular distribution of (d,n) and (d,p) reactions, effect of coulomb field on, 7: 2402(J)

cosmic-ray-initiated jet in nucleus, 7: 2153(J)

coupling of angular momenta in, 7: 2140(J)

isotopic spin selection rules in, effect of coulomb forces on, 7: 2386(J)

of nucleons of several-hundred Mev with nucleons and nuclei, critical review, 7: 2658(J)

photodisintegrations, review, 7: 2154(J)

production of polarized particles in, 7: 2385(J)

statistical theory of, 7: 3191

theory of, involving polarized deuterons, 7: 2639

Nuclear reactors

(See Reactors and names of reactors indexed specifically.)

Nuclear spectra

problems of, applications of improved β and γ spectrometers to, 7: 3540(J)

theory and determination of, 7: 3573(J)

Nuclear spin

(See also as subheading under specific elements and isotopes.)

analytical representation of, 7: 3651(J)

detection in forbidden components of Zeeman effect, 7: 2650(J)

determination by inelastic scattering, 7: 2886(J)

determination from electronic paramagnetic resonance, review, 7: 2646(J)

regularities in, relation to shell model, 7: 3193(J)

Nuclear structure

(See also as subheading under specific elements and isotopes; see also Nuclear models.)

energy matrix of tensor forces in, evaluation, 7: 2711(J)

orbital configurations in, and correlation with atomic structure, 7: 2111(J)

problems of, review, 7: 3554(J)

Nuclear theory

(See also Nuclear models.)

Nuclear theory (Cont'd)

adiabatic nuclear potentials from symmetric pseudoscalar theory of nuclear forces, 7: 2640(J)

charge independence of nuclear forces, 7: 2122

energy in nuclear fields, 7: 2104(J)

meson theory of nuclear forces, higher order corrections in, 7: 2110(J)

nonexistence of stable isobars with odd mass number, proof of, 7: 3194(J)

nuclear forces, review on advancement in knowledge of, 7: 2641(J)

pseudoscalar mesons with pseudoscalar coupling, pair creation in, 7: 2709(J)

saturation properties of nuclear forces, verification by binding energy calculations of spin-parallel nuclei and neutron clusters, 7: 3570(J)

solution of first-order meson wave equations from generalization of Dirac's electron theory, 7: 2710(J)

Nuclei

(See also subheadings under elements and isotopes for properties and reactions of specific nuclei; also headings beginning with Nuclear.)

absorption, scattering, and production of π mesons in, 7: 2866(J)

aligned, polarization of γ rays emitted by, 7: 3563(J)

aligned, population distribution functions for, 7: 3571(J)

compound, cross sections for formation by proton, deuteron, and α -particle reactions, 7: 3557(J)

deformability of, from shell-model calculations, 7: 3107(R)

energy levels of odd-odd, theory, 7: 3558

energy levels of P-shell, by second-order perturbation calculations, 7: 3210(J)

excitation energy of heavy, described by real Fermi gas, 7: 2113(J)

excited states of, in jj coupling, 7: 3197(J)

first excited state of even-even, properties of, 7: 3559(J)

first excited states of even-even, application of collective nuclear model to, 7: 3211(J)

interaction with nucleons of several hundred Mev, critical review, 7: 2658(J)

mass and neutron and proton binding energies of translead, 7: 2184

masses of, graph of nuclide energy valley from, 7: 3192(J)

neutron reactions (n,p), (n, α), and (n,2n) at 14.5 Mev, tables of cross sections, 7: 2382

orbital-electron capture by, atomic excitation and ionization accompanying, 7: 2689(J)

oriented, angular correlation of successive γ quanta emitted by, 7: 3566(J)

oriented, angular distribution and polarization of γ radiation emitted from, 7: 3201(J)

oriented, directional distribution and polarization of β and γ rays emitted by, 7: 3564(J)

pseudo-quadrupole effect for, in molecules, 7: 2129(J)

punched-card classification of, 7: 2041(J)

radii of α -emitting, classification as function of neutron excess, 7: 2114(J)

spin interactions of accelerated, in molecules, 7: 3569(J)

transparency to high-energy neutrons, diffraction effect illustrating, 7: 3196(J)

Nuclei (cells)

(See also Chromosomes; Genetics; Nucleic acids; Nucleotides.)

staining of irradiated, techniques for, 7: 2237(J)

Nucleic acids

(See also Ribonucleic acids.)

adenine incorporation into, in mice, 7: 1957

biosynthesis of tritium-labeled, 7: 2534(J)

chemical properties, 7: 3297(R)

degradation of pentose nucleic acids by base-catalyzed alcoholysis, 7: 2753

effects of radiation on biosynthesis of, 7: 2730(R)

metabolism of, tracer study, 7: 3297(R)

phosphorus incorporation into, during meiosis and mitosis, 7: 2494(J)

Nucleon showers

penetrating, rates of occurrence under C, Al, H, and Pb, 7: 3122(J)

Nucleons

(See also Neutrons; Protons.)

interactions between, nomographic method for determination of primary-particle energy, 7: 3588(J)

interactions between, S-matrix method in study of, 7: 2093(J)

interactions between high-energy, meson production from, 7: 2089(J)

interactions with mesons, theory, 7: 2091(J)

interactions with nucleons and nuclei, critical review, 7: 2658(J)

low-energy singlet nucleon scattering by, effect of short-range repulsion on, 7: 3657(J)

mass spectrum for heavy, showing corresponding cohesive mesons, 7: 3177(J)

meson scattering by, graphical method for obtaining phase shifts from experimental data, 7: 3188(R)

Nucleons (Cont'd)

- π -meson scattering by, theory, 7: 2109(J)
- scattering by nuclei, properties of effective range in theory of, 7: 3241(J)
- scattering by nucleons, deuterons, and mesons, charge independence in, 7: 2122
- scattering by nucleons, test for charge independence in, 7: 2414(J)
- Tomonaga approximation applied to "intermediate" coupling of, with mesons, 7: 3643(J)

Nucleoproteins

- separation, 7: 3297(R)

Nucleotides

- (See also Nucleic acids.)
- adenine incorporation into, in mice, 7: 1957
- separation by ionophoresis on paper, 7: 2276(J)

Nucleotides, desoxy-

- separation and metabolism of fractions of, tracer study, 7: 2487

O

Oak Ridge Inst. of Nuclear Studies

- progress report, 7: 2454(R)

Oak Ridge National Lab.

- progress reports on health physics, 7: 3327(R)
- progress reports on instrument research and development, 7: 3141(R)
- progress reports on physics, 7: 2009(R), 2873(R)
- 9,11,13-Octadecatrienoic acid
(See Eleostearic acid.)

Octane

- diffusion of CS₂ in, under pressure, 7: 2755

Oils

- (See also Greases; Lubricants.)
- effects of radiation on combustion in diesel engines, 7: 2940(R)

Oral epithelium

- effects of continuous radiation on formation of large atypical nuclei in, 7: 2237(J)

Orange oxide (UO₃)

- (See Uranium (VI) oxides.)

Oregon

- uranium and thorium occurrences in, bibliography in, 7: 3438

Organic acids

- (See also specific organic acids.)
- corrosive effects on Ti, Zr, and stainless steel, 7: 3427(J)

Organic compounds

- (Specific organic compounds are indexed according to precedents found in such standard reference works as Chemical Abstracts; Handbook of Chemistry and Physics; Index Medicus; Biological Abstracts; etc.)
- entropy of solutions of, 7: 3001
- polarographic behavior at dropping Hg electrode in non-associated anhydrous solvents, 7: 2495(R)
- radiation chemistry, 7: 3392(R)
- synthesis by electrolytic methods, bibliography on, 7: 3354

Oscillators

- (For electronic oscillators only; see also Oscillographs; Pulse generators (electronic).)
- analytical applications of high-frequency, 7: 3141(R)

Oscillographs

- sweep circuits for, design, 7: 2052(R)

Osmium isotopes Os¹⁸⁵

- decay scheme and half life, 7: 3632(J)

Osmium isotopes Os¹⁹¹

- decay scheme, 7: 2873(R)
- decay scheme and half life, 7: 3632(J)

Osmium isotopes Os¹⁹³

- decay scheme and half life, 7: 3632(J)

Ovaries

- (See Gonads.)

Oxidation

- biochemical, in sewage, effects of radiation on, 7: 3303
- of metals at high-temperatures, bibliography on, 7: 3448

Oxides

- (See also Peroxides.)
- vapor pressure data for, of elements Br to U, 7: 2758

Oxime complexes

- crystal structure determined by x-ray diffraction, 7: 2586

Oxine

- (See 8-Quinolinol.)

Oxo acids

- synthesis, 7: 2498(R)

Oxygen

- activities produced in, by N¹³ ion bombardment of, 7: 2150(J)
- determination in gases in range below 100 ppm, 7: 3360
- determination in Zr by HCl volatilization method, 7: 2525
- effects on production of chromosomal aberrations by fast neutrons in *Tradescantia*, 7: 1878(J)
- effects on production of chromosomal aberrations by x radiation in *Drosophila*, 7: 1883(J)
- electrochemical determination in gases, 7: 3362(J)
- helium ion (He³) reactions with, activities produced by, 7: 2887(J)
- isotopic exchange reactions with H₂O, catalysis of, 7: 2529(J)
- neutron elastic and inelastic scattering cross sections, cloud chamber studies, 7: 2165(J)
- neutron reactions, π^+ mesons produced by, 7: 2088, 2578(R)
- neutron reactions (n, γ) cross sections for, 7: 2655
- neutron total cross sections for 14-Mev neutrons, 7: 2871(J)
- neutron total cross sections in 3- to 12-Mev region, 7: 2123(J)
- physical properties at low temperatures, 7: 2549
- solubility in liquid Bi, 7: 3357(J)
- spectrographic determination in Ti, 7: 3361
- vacuum fusion determination in Cr, 7: 2766
- Oxygen-chromium-titanium systems
- phase studies in Ti rich region, 7: 2570
- Oxygen electrodes
- cathodic polarization associated with, in air cells, 7: 2759
- Oxygen isotopes
- energy levels, 7: 2893
- exchange between H₂O and HNO₃, 7: 1960(J)
- Oxygen isotopes O¹⁸
- alpha scattering by, over 0.94- to 4.0-Mev range, 7: 2895
- Oxygen isotopes O¹⁷
- nuclear magnetic moments, exchange contribution to, 7: 2389(J)
- Oxygen-titanium systems
- (See also Titanium oxides.)
- constitution diagrams and mechanical properties, 7: 3103
- Oxygen-vanadium systems
- structure, lattice parameters, and temperature-composition existence of, 7: 2823(J)

P

Packed columns

- hydrodynamic characteristics, 7: 3413
- mass transfer in gas phase in, effects of fluid properties on, 7: 3413
- Packing fraction
- (See as subheading under specific isotopes.)

Pair production

- (See as subheading under specific radiations and particles.)

Palladium

- adsorption and solution of H₂ by dispersed, 7: 3048(J)
- Palladium isotopes Pd¹⁰²
- neutron activation cross section, 7: 3577(J)
- Palladium isotopes Pd¹⁰³
- preparation of carrier-free, by paper chromatography, 7: 2783(J)
- Palladium isotopes Pd¹⁰⁴
- energy levels, 7: 2182
- Palladium isotopes Pd¹⁰⁶
- nuclear spin and magnetic moment, 7: 2645(J)
- Palladium isotopes Pd¹⁰⁹
- half life, 7: 3577(J)
- Palladium-nickel alloys
- adsorption and solution of H₂ by dispersed, 7: 3048(J)
- Palladium-platinum alloys
- solution and adsorption of H₂ by dispersed, 7: 2277(J)

Pancreas

- effects of radiation from injected Zn⁶⁵ on physiology of, 7: 2462(J)

Paper chromatography

- (See Chromatography.)

Paraffin

- (Reserved for hydrocarbon wax; for compounds of the paraffin series see Alkanes and the specific compounds.)

- absorption of soft component of cosmic radiation in, 7: 3120(J)
- μ^+ -meson lifetime in, 7: 2379(J)
- neutron production by cosmic rays in, at 0 to 54° latitude and 30,000 ft pressure altitude, 7: 3123(J)
- neutron scattering by, 7: 2167(J)

Paramecium

- effects of direct irradiation and of irradiation of medium on growth of, 7: 2727(R)
- effects of x irradiation on micronuclear number in, 7: 2472(J)

- Particle accelerators
(See Accelerators.)
- Particle collectors
(See also Cascade impactors; Electrostatic precipitators; Filters; Thermal precipitators.)
efficiency, 7: 2542(R)
- Particle trajectories
calculation of, 7: 2021(J)
stereoscopic recomposing and measuring of, method and apparatus for, 7: 3672(P)
in two-dimensional electric field with space charge, modeling of, 7: 2326(J)
- Peace River Area (Alaska)
geology, prospecting, and mineralogy, 7: 3083
- Pennsylvania State Coll.
progress reports on petrographical investigations of salt wash sediments, 7: 3436(R)
- Pennsylvania State Coll., School of Mineral Industries
progress reports on mineralogy and petrography of U-bearing shales, 7: 2299(R)
progress reports on mineralogy of U-bearing deposits in the Boulder, Batholith, Mont., 7: 3432(R)
- Pennsylvania Univ.
progress reports on heterogeneous catalysis, 7: 2760(R)
progress reports on superconductivity of metals and alloys, 7: 3454(R)
- Pentane, 2,4-dimethyl-
diffusion of CS₂ in, under pressure, 7: 2755
- 2,4-Pentanedione
as reagent in determination of μ g amounts of Be, 7: 3359
- Pentanes
synthesis of 1- and 3-C¹⁴-labeled, 7: 3054(J)
- Pentobarbital sodium
synergistic effects with cysteine against radiation injury, 7: 2730(R)
- Pentosenucleic acids
(See Nucleic acids.)
- Perchlorates
divalent metal, hydration in nonaqueous solvents, 7: 1912
- Periclase
(See Magnesium oxides.)
- Periodic systems
of isotopes, 7: 2354(J)
length of period as function of azimuthal quantum number, 7: 2262(J)
position of Th, Pa, and U in, 7: 3004(J)
statistical theory of electron-shell configurations in, 7: 3013(J)
- Peroxides
phosphorescence and photochemical reactions of, 7: 2997
- Personnel meters
(For dosimeters and pocket alarms see Radiation detection instruments (on current type); see Photographic film detectors.)
- Pertechnetates
solvent extraction of Tc in form of tetraphenylarsonium, 7: 2274(J)
- Perturbation theory
divergence of, for quantized fields, 7: 2202(J)
- pH
(See Hydrogen ion concentration.)
- Phase diagrams
(See Constitution diagrams.)
- Phenol
production by γ rays in aqueous benzene solution, 7: 2779(J)
- Phenol, p-chloro-
radon compound of, synthesis, 7: 3055(J)
- Phosphatase activity
effects of radiation on, in bone, 7: 3297(R)
of intestine, effects on digestion of phosphorylated compounds, 7: 2946
of kidney and duodenum in adrenalectomized and irradiated rats, 7: 3313(J)
- Phosphate complexes
with calcium, chemical stability of, 7: 3002
- Phosphate fertilizer
(See Phosphates.)
- Phosphate rock
spectrographic analysis for rare earths and Th, 7: 2503(J)
- Phosphates
(Including phosphate fertilizers; see also specific phosphate compounds; see also Metaphosphates.)
in sugar separation, by ion exchange using borate complex, 7: 3398(J)
- Phosphatides
metabolism in brain, effects of corticotropin on, 7: 2977
- Phospholipids
(See Phosphatides.)
synthesis in normal and burned rat skin, 7: 2962
- Phosphorescence
(See also as subheading under specific materials; see also Fluorescence; Luminescence; Phosphors.)
alpha-particle induced, of Ag-activated NaCl, 7: 3256(J)
- Phosphoria Formation (Idaho)
uranium distribution in, 7: 3441
- Phosphoric acid, butyl esters
(See Butyl phosphates.)
- Phosphors
(See also specific phosphorescent compounds; see also Luminescence; Phosphorescence.)
alpha-particle induced phosphorescence of Ag-activated NaCl, 7: 2638(R), 3256(J)
effects of electric fields on luminescence of ZnS(Cu) phosphor excited by near-ultraviolet radiation, 7: 2035(J)
effects of neutron irradiation on ZnS(Cu), 7: 2683(J)
effects of radiation on fluorescence of organic, 7: 3615(J)
electronic transitions in luminescence of ZnS, 7: 3164(J)
fluorescence of British TPBD plastic and anthracene, comparison, 7: 2611(R)
fluorescence and photosensitivity of, 7: 2997
interaction of Mn activator ions in zinc-orthosilicate, 7: 2627(J)
preparation and efficiency of organic, 7: 2052(R)
properties of solid noncrystalline, 7: 2082(J)
wavelength dependence of fluorescence of organic, in x-ray region, 7: 2083(J)
- Phosphors (liquid)
effects of age on naphthalene-xylene fluorescence, 7: 2065(J)
energy transport in fluorescence of, 7: 2626(J)
- Phosphorus
incorporation into nucleic acids, radioautographic study, 7: 2494(J)
incorporation into teeth of rats and hamsters, tracer study, 7: 2492(J)
metabolism, measured by modified Schmidt-Thannhouser procedure combined with ionophoresis, 7: 2276(J), 2530(J)
metabolism by uterus, effects of hormones on, 7: 2252(J)
neutron total cross sections for 14-Mev neutrons, 7: 2871(J)
tissue distribution of, radioautographic techniques for studying, 7: 2981
- Phosphorus isotopes P³¹
nuclear magnetic resonance multiplets observed in liquids containing, 7: 2394(J)
- Phosphorus isotopes P³²
beta decay, coincidences in, 7: 2423(J)
beta decay, emission of atomic electrons in coincidence with, 7: 2196(J)
effects of fertilizer labeled with, on plant growth, 7: 2234(J)
effects of ingested, on life span of wasps, 7: 2467(J)
half life, 7: 2688(J)
lethal (LD₅₀) dosage determinations for mice, 7: 2730(R)
quantitative estimation of, when mixed with Na²⁴ in body fluids and tissues, 7: 2248(J)
separation from S³² by ion exchange resins, 7: 3039
therapy of blood diseases with, 7: 2482(J)
therapy of polycythemia and leukemia with, case histories, 7: 3335(J)
- Phosphorus oxides
high-temperature reactions, 7: 2588
- Photochemistry
(See also appropriate subheadings under specific materials; see also Photosynthesis.)
of complex molecules in condensed phase, 7: 2997
- Photoconductivity
a-c space-charge polarization effects in, theory, 7: 3467
- Photodisintegration
(See Gamma reactions as subheading under specific nuclei; see appropriate subheadings under Gamma radiation and X radiation; see Nuclear reactions; Photochemistry; Photofission.)
- Photofission
(See also appropriate subheadings under specific materials.)
review, 7: 2154(J)
- Photographic film
(See also Nuclear emulsions.)
in measuring dosage distribution from Ra needles and plaques, 7: 2061
- Photographic film detectors
(See also Nuclear emulsions.)
for fast neutron dosimetry, design of, 7: 3327(R)
Land self-developing, performance of, 7: 3510
performance, 7: 3515(R)
for personnel monitoring, manual on, 7: 2239
Raydos badge, performance of, 7: 2053
reading, 7: 3513
- Photographic plate techniques
(See Photographic films; Photographic film detectors.)

Photometers

- automatically recording internal-standard, design, **7: 3141(R)**
- comparative electronic, design, **7: 2446(P)**

Photometric analysis

(See Spectrophotometric analysis.)

Photomicrography

- laboratory handbook for nuclear microscopy, **7: 3513**

Photomultiplier tubes

- mixer circuit for system of, design, **7: 3502(J)**
- performance of H-4646, **7: 3498(R)**
- for scintillation counting, design of, **7: 2062(J)**
- voltage-pulse shape in scintillation-detector use, calculation of, **7: 2074(J)**

Photons

(See also Cosmic photons; Gamma radiation; X radiation.)

- Compton scattering in homogeneous magnetic field, **7: 3247(J)**
- interactions of, wave-mechanical potentials in, **7: 2702(J)**
- mass of, **7: 3293(J)**
- momentum transfer and angle of divergence of electron-positron pairs produced by, **7: 2681(J)**
- pair production by, in homogeneous magnetic field, **7: 3243(J)**

Photoperiodism

- effects on floral initiation in xanthium, **7: 2728(R)**

Photosynthesis

(See also Photochemistry.)

- bibliography on, **7: 3339**
- path of C in, and primary quantum conversion act of, review, **7: 2764**
- review of processes in, **7: 3339**

Photosynthetic products

- effects of antibiotics on formation of, **7: 1906**

Phototubes

(See Photomultiplier tubes.)

Phthalates

- thorium complexes of, **7: 3003(J)**

Physiology

- equipment for measuring response to heat stimulus, **7: 2729(R)**

Phytate complexes

- with calcium, chemical stability of, **7: 3002**

Picolines

- miscibility with D₂O, **7: 1932(J)**

Pigs

(See Swine.)

Piles (nuclear reactors)

(See Reactors.)

Pions (π mesons)

(See Mesons (π).)

Pipes

- flow of boiling water in, two-phase pressure drop and burnout data for, **7: 1971**

Pipettes

- control system for remote operation of piston-type, **7: 3141(R)**
- remote-controlled, for radioisotopes, **7: 1947**

Pitchblendes

(See also Uraninites.)

- geology and genesis of, throughout the world, **7: 3445(J)**
- occurrence in Marysville ore, **7: 3077(R)**

Pittsburgh Univ.

- progress reports on KCl-NaCl solid solutions, **7: 2998(R)**
- progress reports on organic syntheses, **7: 2787(R)**

Pituitary gland

- effects of irradiation of, on sexual system of rats, **7: 2231(J)**
- thyroid stimulating hormone-secreting tumors of, relationship of growth to thyroid function, **7: 2983(J)**

Placental tissues

- selective transmission of alkaline earths and Pu by, **7: 1863**

Placer deposits (Alaska)

- radioactive mineral content of, **7: 3083**

Placer deposits (Calif.)

- mineralogy, **7: 3435(R)**

Placer deposits (Idaho)

- mineralogy, **7: 3435(R)**

Plant cells

- effects of H₂O₂ on metabolism of, **7: 1874(J)**
- lethal effects of radiation on yeast, mathematical theory of, **7: 2225**

Plant metabolism

(See also as subheading under specific materials.)

- effects of antibiotics on, **7: 1906**
- effects of radiation on biochemical oxidation in sewage, **7: 3303**

Plant physiology

- effects of photoperiodism on floral initiation, **7: 2728(R)**
- growth response of plants cultured with enriched levels of N¹⁵, **7: 2728(R)**
- tracer techniques in, merits of, **7: 3342**

Plants

(See also specific plants by name.)

- deuterium concentration by, **7: 2265(J)**
- effects of P³²-labeled fertilizer on growth of, **7: 2234(J)**
- effects of radiation on growth and yield of, **7: 1887(J)**
- tumors produced in *Ipomoea tuba*, following exposure to radiation from an atomic explosion, **7: 2461**
- uptake of fission products, effect of soil type on, **7: 2489**

Plasma

(See also Blood plasma; Electric arcs.)

- high-frequency oscillations in, due to charged particles, **7: 3133**
- interaction of microwaves propagated through, at various pressures, **7: 3184(J)**
- motion of charged particle in, theory, **7: 3134(J)**
- spectra of systems of interacting particles in, **7: 3291(J)**

Plastic deformation

- of crystals, by glide, mathematical analysis of, **7: 3132(J)**

Plastics

(See also specific compounds used as plastics.)

- effects of radiation on, **7: 2919(R)**
- molding of, for a tissue-equivalent ionization chamber, **7: 2610**
- preparation of tissue-equivalent, **7: 2610**
- thermal conductivity of, **7: 2549**

Platinum

- high-temperature reactions, **7: 2588**
- neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, **7: 2875**
- polarographic studies with, **7: 3465(R)**
- proton scattering by, **7: 3605(J)**

Platinum catalysts

- decomposition of CO over platinized silica gel, **7: 2760(R)**

Platinum isotopes Pt¹⁹¹

- gamma emission following electron capture in, **7: 3616(J)**

Platinum isotopes Pt¹⁹³

- isomeric transition, **7: 3616(J)**

Platinum-palladium alloys

- solution and adsorption of H₂ by dispersed, **7: 2277(J)**

Plutonium

- quenching action of, on fluorescence of U in NaF phosphors, **7: 3156**
- radiometric determination, procedure for, **7: 1922**
- selective transmission by placental tissue, **7: 1863**
- toxicology of, for rats, **7: 2726(R)**

Plutonium isotopes Pu²³⁸

- alpha fine structure intensity, **7: 2690(J)**

Plutonium isotopes Pu²³⁹

- production by induced radioactive chain, reaction kinetics and economic aspects of, **7: 3215(J)**

Plutonium isotopes Pu²⁴⁰

- alpha fine structure intensity, **7: 2690(J)**

Plutonium isotopes Pu²⁴¹

- beta spectrum, contribution of electron binding energy to, **7: 3623(J)**

Plutonium poisoning

- therapy with Ca and Na salts of (ethylenediamine) tetraacetic acid, **7: 2957(R)**

Plutonyl ions

- paramagnetism of, theory, **7: 1963(J)**

Pocket chambers

- charging device for, design, **7: 2036(J)**
- design, **7: 3671(P)**
- Landsverk 0.2 r, calibration of, **7: 2054**
- Victoreen 1000-r, modification to reduce errors when used with high-energy γ rays, **7: 2614(J)**

Polarographs

- design, **7: 3141(R)**

Polarography

- anodic reactions in, **7: 2840**
- electrode for, design and performance, **7: 2840**
- of organic compounds at the dropping Hg electrode in non-associated anhydrous solvents, **7: 2495(R)**
- with stationary electrodes, **7: 3465(R)**

Polaroid Corp.

- progress reports on photodosimeters of dry development type, **7: 3515(R)**

Polonium

- effects on hemoglobin synthesis, tracer study, **7: 2982**
- oxidation of ferrous sulfate by, **7: 3031(J)**
- periodicities in intervals between α emission by, **7: 2195(J)**
- reduction of ceric salts by, **7: 3031(J)**

Polonium isotopes Po²⁰⁸

- alpha fine structure intensity, **7: 2690(J)**

- Polonium isotopes Po^{210}
half live of, determined by calorimetric methods, **7: 3259**
ionization of K and L shells by α decay, probability of, **7: 3272(J)**
- Polonium isotopes Po^{214}
nuclear energy levels, **7: 3629(J), 3630(J)**
- Polonium isotopes Po^{218}
alpha-particle energy, **7: 3274(J)**
- Polonium sources
(See sources by type of radiation emitted, e.g., Alpha sources.)
- Polycrystals
(See also specific polycrystals.)
invariance of susceptibility tensor of, theory, **7: 1946(J)**
- Polycythemia
therapy with P^{32} , **7: 2482(J)**
therapy with P^{32} , case histories, **7: 3335(J)**
- Polythene
(See Ethylene polymers.)
- Polymers
effects of high-energy radiation on, **7: 2521(J)**
effects of radiation on chemical and mechanical properties, **7: 1989**
- Polystyrene
(See Styrene polymers.)
- Polytechnic Inst. of Brooklyn
progress reports on insulation, **7: 3392(R)**
- Populations
(See also appropriate subheadings under geographic areas; see also Genetics.)
genetic analysis of adaptive values of *Drosophila*, **7: 1866(J)**
- Porous materials
(See also specific porous materials, e.g., Graphite.)
permeability and surface area measurements of, by flow methods, **7: 1973(R)**
- Porphyrin complexes
with rare earths, preparation, **7: 2480(R)**
- Porphyrins (labeled)
tumor diagnosis with, case histories, **7: 2249(J)**
- Portland cements
physical properties, **7: 2425**
- Positronium
(See Hydrogen ions.)
- Positrons
(See also Electrons.)
absorption in Al, Cu, and Au relative to electron absorption, **7: 2909(J)**
interactions involving a de Broglie field, statistical, **7: 3287(J)**
mass-spectrometric comparison of m/e for electrons and, **7: 2849(J)**
reactions with Cl_2 gas, mathematical treatment of complexes formed, **7: 3116(J)**
- Potassium
metabolism, tracer study, **7: 3296(R)**
metabolism in alga *Ulva lactuca*, **7: 1861**
neutron capture, gamma rays from, **7: 3107(R)**
tissue distribution of, and hematological effects of K^{42} and K^{43} , **7: 2957(R)**
- Potassium amide
exchange of H_2 with liquid- NH_3 solutions of, mechanism of, **7: 2258**
preparation, **7: 2258**
- Potassium chlorates
decomposition by radiation, **7: 3395(J)**
- Potassium chloride-lithium chloride systems (liquid)
corrosive effects on Ti, **7: 3092(R)**
- Potassium chloride-rubidium chloride systems
x-ray-induced F bands in mixed crystals of, **7: 2421(J)**
- Potassium chloride-sodium chloride systems
heat of formation, crystal structure density, Schottky defects, and mutual solubility of, **7: 2998(R)**
- Potassium chlorides
magnetic susceptibility of colored, from 1 to 300°K, **7: 3106**
x-ray emission spectra, **7: 2319**
- Potassium chlorides (liquid)
corrosive effects on Ti, **7: 3092(R)**
- Potassium fluorides
base strength and conductance in anhydrous HF, **7: 3022(J)**
- Potassium hydroxides
exchange with H_2 gas, mechanism of, **7: 2256**
- Potassium ions
production of high-density currents of, by hot W wire in K vapor, **7: 3233(J)**
- Potassium isotopes
mass, **7: 3150(J)**
- Potassium isotopes K^{39}
nuclear magnetic moments, exchange contribution to, **7: 2389(J)**
- Potassium isotopes K^{40}
beta spectra and half life, **7: 3509**
- Potassium isotopes K^{42}
beta-gamma angular correlation, multipole interference effects in, **7: 3279(J)**
nuclear spins and magnetic moments, **7: 3207(J)**
- Potassium nitrates
decomposition by radiation, **7: 3395(J)**
- Potassium rhenides
preparation of solid, **7: 1917**
- Potassium-sodium alloys
burns of skin from, protection and therapy, **7: 2726(R)**
- Potassium-sodium alloys (liquid)
effects of wetting on heat transfer characteristics of, **7: 3412**
- Potassium sulfates
diffusion in aqueous solutions, effects of pressure on, **7: 2757**
- Potassium zirconium fluorides
electrolysis of, for production of Zr, **7: 3098(R)**
- Potentiometers
self-balancing recording, range extension without reducing resolution in, **7: 2843**
- Poultry
(See Chickens.)
- Powder metallurgy
(See also appropriate subheadings under specific materials.)
conference on, in Europe, June 1952, review of papers, **7: 2308**
- Powders
(See also by materials, e.g., Nickel powders.)
particle-size distribution in sub-sieve range, sedimentation balance for, **7: 1969(J)**
- Power breeder reactors
(See also Breeder reactors.)
design and cost factors, **7: 2137(J)**
- Power supplies
(See also specific instruments and components; see also Accelerator tubes.)
high-voltage, design, **7: 3141(R)**
for scintillation counters, design, **7: 2033(J)**
for scintillation detectors, proportional detectors, and rate meters, circuit diagrams and characteristics of, **7: 3140**
spring-driven, for use with radiation counters, **7: 2448(P)**
- Praseodymium
electrochromatographic separation of, **7: 1955(J)**
ground state hyperfine structure and nuclear magnetic moment of, **7: 2127(J)**
- Praseodymium isotopes Pr^{141}
nuclear magnetic moment, **7: 2882(J)**
- Precipitators
(See Cascade impactors; Electrostatic precipitators; Particle precipitators; Thermal precipitators.)
- Presbyterian Hospital, Chicago
progress reports, **7: 1862(R)**
- Pressure broadening
(See appropriate subheadings under radiation concerned; see specific spectra by name of radiation.)
- Pressure drop
(See also Fluid flow; Gas flow.)
resulting from turbulent flow of noncompressible fluids through tees, **7: 2793**
- Pressure vessels
cracking, influence of corrosion on, **7: 2006(J)**
- Prince of Wales Island (Alaska)
prospecting for Th and U, **7: 2801**
- 1,2,3-Propanetriol
(See Glycerol.)
- 2-Propanol, 2-methyl--cobalt chloride-water systems
phase studies, **7: 2993**
- Prophylaxis
(See appropriate subheadings under specific pathological conditions and under specific materials.)
- Propionic acid, fluoro-synthesis of derivatives of, **7: 3405(J)**
- Proportional detectors
as alpha counting instruments, evaluation of, **7: 2854**
analysis of fluorescent x radiation with, **7: 2851**
argon type 1077B, performance, **7: 2603**
characteristics of BF_3 counters and precautions in their use, **7: 3157**
design, **7: 2617(J)**
in electron capture detection, applicability of 4π type, **7: 2364**
for measurement of β particles, characteristics of, **7: 3165(J)**
for measurement of low-energy β particles and electrons, **7: 3529(J)**

Proportional detectors (Cont'd)

- methane-filled, saturation backscattering correction for, 7: 2613
- quenching of photons in A- and A-CO₂-filled, 7: 3533(J)
- voltage supply of 1 to 4 kev for circuit diagrams of, 7: 3140

Prospector Mine (Utah)

- mineralogy and uranium distribution, 7: 3077(R)

Protactinium

- chemical properties, and metabolism in rats, cattle, sheep, and swine, 7: 2731(R)

- position in periodic system, 7: 3004(J)

Protactinium isotopes Pa²³¹

- gamma emission accompanying α decay of, 7: 2685(J)

Protactinium isotopes Pa²³³

- purification, 7: 2731(R)

Protactinium isotopes Pa²³⁴

- beta spectrum, Auger lines in, 7: 3628(J)

Protective clothing

- decontamination of rubber and neoprene gloves, 7: 2738(R)

Proteins

- effects of H₂O₂ on metabolism of, 7: 1874(J)
- separation and sedimentation constants of, in blood serum of chick embryos, 7: 282

Protium (H¹)

- (See Hydrogen.)

Proton scattering cross sections

- at low energies, calculation of, 7: 3242(J)

Proton spectrometers

- design, 7: 2638(R)

Proton synchrotrons

- (Varying magnetic field proton accelerators; for electron synchrotrons see Synchrotrons; for specific proton synchrotrons see also Bevatron and Brookhaven synchrotron.)

- focusing of, approaches to problem of resonance effect in, 7: 2890
- focusing of, elimination of alignment defects in, 7: 2891(J)
- strong focusing system for, algebraic analysis of betatron oscillation problem in, 7: 3230

Protons

- (See also Cosmic protons.)

- cross sections for formation of compound nuclei by, 7: 3557(J)
- detection and measurement with nuclear emulsions, 7: 2375(J)
- deuteron reactions ($p + d \rightarrow t + \pi^+$), cross sections for, 7: 2578(R)
- Fermi-type interaction of, theory, 7: 2212(J)
- π^\pm -meson scattering by, coulomb interference effects in, 7: 3190(R)
- multiple scattering in thin foils of Pt, Ag and photographic emulsion, 7: 3605(J)
- neutron reactions, γ spectra from, 7: 3226(J)
- neutron reactions (n, γ), cross section for 340-Mev, 7: 2409(J)
- neutron reactions (n, γ)d, cross section for 200 to 250 Mev, 7: 2401(J)
- neutron scattering by, 7: 2323
- neutron scattering by, calculation of Fermi scattering length in, 7: 3245(J)
- neutron scattering by bound, 7: 2167(J)
- nuclear magnetic moment ratio of deuterons to, 7: 2590(R)
- production of π mesons by nuclear reactions of, 7: 2866(J)
- proton capture by, cross section and energy production of, 7: 2012(J)
- proton scattering by, angular distributions at 18.3 and 32.0 Mev, 7: 2171(J)
- proton scattering by, effect of excited isobaric states on, 7: 3250(J)
- proton scattering by, energy dependence of the phase shift in, 7: 3244(J)
- proton scattering by, polarization effects in, 7: 2164(J)
- proton scattering by 435-Mev, 7: 3235
- range-energy relation in Al, mean excitation potential, 7: 2914(J)
- range-energy relation in nuclear emulsions, 7: 3249(J)
- range-energy relation of intermediate energy, in air, 7: 3607(J)
- range-energy relation of 10- to 250-kev, in gases, 7: 3234
- resonance capture of electrons from H atoms by slow, 7: 2341(J)
- scattered by neutrons of 13.7 and 28.4 Mev, angular distribution of, 7: 2910(J)
- scattering by light nuclei, positron-induced deviation from Coulomb scattering, 7: 2009(R)
- scattering by neutrons, 7: 3603
- scattering by neutrons, comparison of Born and Heitler expansions, 7: 3556(J)
- scattering of 32-Mev, by deuterons, 7: 2899
- star production and mean free path in nuclear emulsion of 240-Mev, 7: 2144(J)
- star production in nuclear emulsions, cross sections for, 7: 3608(J)

Protozoa

- (See also specific genera.)

- effects of x rays, cyanide, and radiation-prophylactic agents on infusoria, 7: 2968(J)
- guanine metabolism by *T. geleii*, 7: 2941

Pulse analyzers

- (See also Oscillographs.)

- calibration of, Los Alamos Model 500 pulser for, 7: 3138
- fast pulse-amplitude discriminator, design, 7: 2038(J)
- multi-channel, design, 7: 3141(R)
- multi-channel, design and performance, 7: 2348
- multi-channel, design for low counting rates, 7: 2594(J)
- performance in coincidence counting, 7: 2032(J)
- recording, design, 7: 3142
- single-channel, of high speed and stability, design, 7: 2037(J)
- single-channel model 5-Q-1192, design, 7: 2030
- stability and equality of band width, circuit for producing, 7: 2595(J)

Pulse counters

- (See Radiation detection instruments (pulse type); Radiation detectors; Scalers.)

Pulse generators (electronics)

- for calibrating pulse analyzers, design of Los Alamos Model 500, 7: 3138

Pulse generators (pneumatics)

- design, 7: 3141(R)

Pulse modifiers

- design, 7: 3673(P)

Purdue Univ.

- progress reports on design of extensometer for studying plastic flow of materials under stress from deuteron bombardment, 7: 3137

Purine, 6-amino-

- (See Adenine.)

Pyrethrins

- metabolism in cockroach, tracer study, 7: 1904

Pyridines

- miscibility with D₂O, 7: 1932(J)

2,4(1,3)-pyrimidinone

- (See Uracil.)

Pyrites

- flotation, 7: 2800(R)

Pyrometers

- for temperature measurements in the range 0 to 100°C, 7: 3136

Pyrophyllites

- fluorine substitution in, and related minerals, 7: 2786(R)
- thermal stability of, 7: 2786(R)

Quadrupole moments

- (See as subheading under specific materials.)

Quantum electrodynamics

- (See also Field theory; Quantum mechanics.)

- consistent scheme of, with auxiliary fields, 7: 2436(J)
- contribution to level shift in H, 7: 2873(R)
- Feynman diagrams in, number of, 7: 3154
- Green function in, theory, 7: 2206(J)
- nonperturbation approach to, 7: 3645(J)
- radiation formula for electrons in constant magnetic fields, 7: 2340
- self energy of, calculation by renormalization of light velocity, 7: 3656(J)
- test of higher approximations by electron-electron scattering, 7: 2200(J)

Quantum mechanics

- (See also Mathematics; Quantum electrodynamics; see also appropriate subheadings under Radiation.)

- application to relativistic statistical thermodynamics, 7: 2706(J)
- Bohm's interpretation of quantum theory in terms of "hidden" variables, analysis of, 7: 2707(J)
- energy spectra of many-particle quantum systems, theory of, 7: 2204(J)
- formulation of, associated with classical pictures, 7: 3507(J)
- irreversibility in, 7: 2207(J)
- potentials in photon and charged-particle interactions, 7: 2702(J)
- relativistic, of system of interacting particles, 7: 2213(J)
- statistics of fundamental processes for elementary particles, 7: 2214(J)
- uncertainty principle as case of stochastic dependence, 7: 2700(J), 2701(J)

Quartz

- (See also Fused silica.)

- grating spacings and reflection intensities of (310) and (550) planes, comparison, 7: 3167(J)
- lattice expansion due to fast-neutron bombardment, 7: 2180(J)
- luminescence in α -irradiated, 7: 2419(J)
- particle size measurement, 7: 2800(R)
- photoelectric emission from, spectral distribution, 7: 2590(R)
- preparation and cleaning of cone 6 size fraction, 7: 2800(R)
- zeta potential measurements of, in flotation systems, 7: 2800(R)

Quartz Creek District (Alaska)

prospecting, geology, and mineralogy, 7: 3083

Quenching

(See subheading heat-treatment under specific materials.)

8-Quinolinol

in colorimetric determination of V in biological materials, 7: 3364(J)

in fluorimetric determination of Al, 7: 3365(J)

8-Quinolinol chelates

crystal structure determined by x-ray diffraction, 7: 2586

crystal structure of zinc 8-hydroxyquinolate dihydrate, 7: 2585

R

Rabbits

lethal (LD_{50/30}) dosage determination for, exposed to total-body Co⁶⁰ radiations, 7: 2731(R)

Radiation

(See also specific radiations and subheadings concerning radiation emission under specific materials; see also Accelerators; Nuclear particles; Nuclear reactions; Nucleons; Radiation detection instruments; Radiation detectors; Radiation sources; Shielding materials.)

angular correlations in, theory of, 7: 2201(J)

from atomic explosions, tumors produced in plants following exposure to, 7: 2461

attenuation in shielding materials, estimation by tenth thicknesses, 7: 2193(J)

biological effects of, review, 7: 2478(J)

biological effects of, variation with dose rate, 7: 2232(J)

detection, formula for solid angle subtended by finite detector and point source, 7: 2612

detection and measurement of, fast coincidence system for, 7: 3535(J)

dosage determinations and effects on man, 7: 2476(J)

dosages received by samples bombarded in cyclotron, measurement of, 7: 3613(R)

effects of continuous, on formation of nucleic acid complexes in epithelium, 7: 2237(J)

effects of O on changes in chromosomes induced by, in *Tradescantia*, 7: 1878(J)

effects of whole-body, on response of antibodies in mice, 7: 2224

effects on acetylation of p-aminobenzoic acid, 7: 2728(R)

effects on adult and embryonic nervous system, 7: 2951

effects on antibodies, 7: 3319(J)

effects on antibody production, 7: 2952

effects on biochemistry of bone marrow, in rabbits, 7: 1881(J)

effects on chemical reactions, 7: 2940(R)

effects on endocrine glands, in parabiotic rats, 7: 2954

effects on enzyme systems, 7: 2728(R), 2729(R)

effects on human lymphocytes, 7: 2469(J)

effects on infusoria, 7: 2968(J)

effects on vertebrate retina, 7: 3304

half-value layer as a function of ionization measurement precision, 7: 2898

hazards of, to average person in U. S. from natural and industrial sources, review, 7: 2477(J)

heat generation by, in a slab, 7: 3063

induced by detonation of shaped charges, 7: 3631(J)

inhibition of mitosis by, factors affecting, 7: 2236(J)

from injected Zn⁶⁵ effects on pancreatic action in rats, 7: 2462(J)

internal, effects on ovarian follicles, 7: 2230(J)

lethal effects on yeast cells, mathematical analysis, 7: 2225

lethality to rats, effects of fractionation of dose on, 7: 2730(R)

multiple coulomb scattering theory, application to cloud-chamber measurements, 7: 2916(J)

multiple scattering of, application of many-body Schrodinger equation to, 7: 2170(J)

multiple scattering of, corrections to impulse approximation in two-body systems, 7: 2163(J)

multiple scattering of, derivation of Moliere's theory of, 7: 2900(J)

pathological effects of, as indicated by organ weights of growing mice, and growth of *Paramecium*, 7: 2727(R)

pathological effects on eyes, case history, 7: 1892(J)

pathological effects on eyes, spleen, and thymus, 7: 2726(R)

permissible limits for man, determination of, 7: 3323

physiological effects on man, 7: 3297(R)

physiological effects on rats, cattle, sheep, swine, rabbits, and burros, 7: 2731(R)

recovery from biological effects of, studies on silkworm eggs, 7: 1884(J)

scattering, applications of variational principles to, 7: 2912(J)

Radiation damage

(See also units, materials, tissues, etc., exposed to radiation; see also Radiation injuries.)

x-ray diffraction methods for evaluating and measuring, in metals, alloys and inorganic compounds, 7: 2177(R)

Radiation detection instruments

(A complete instrument, not necessarily including the radiation detector component; see also Radiation detectors; Rate meters; Scalers.)

flame proof, design, 7: 2617(J)

microscope for optical scintillation counting, 7: 2971(R)

performance specifications of, for civilian use in radiological warfare, 7: 2365(J)

radiac survey meter for civil defense, proposed circuit for, 7: 2611(R)

Radiation detection instruments (ion current type)

calibration of various survey meters and dosimeters, 7: 2055(R)

calibration of Westinghouse and Tracerlab production model An/PDR-18 radiacmeters, 7: 2607

charging of electrosopes, device for, 7: 2352(J)

direct reading, for high intensity x-ray detection, design, 7: 2058

evaluation of Beckman, Cambridge, Keleket, and Victoreen 20- and 100-r dosimeters, 7: 3158

high tension filter box for BF₃ proportional counters, 7: 2366(J)

performance of IM-9()/PD quartz-fiber dosimeters, 7: 2056

radiacmeter IM-79()/PD, design and performance of, 7: 2361(R)

transistor uses in, 7: 2363(R)

Radiation detection instruments (pulse type)

for assaying β activity in water supplies, evaluation of, 7: 3325

automatic γ isodose recorder, design and performance of, 7: 3172(J)

for continuous γ monitoring of process streams, 7: 2604

counting efficiency of liquid scintillation counter for C¹⁴ counting, 7: 3512

dead-time correction for monitored, 7: 2081(J)

deadtime in, cut-off circuit for reducing, 7: 2638(R)

for demonstration purposes, design, 7: 2077(J)

fast amplitude discriminator and scale-of-ten counting unit for, design, 7: 2038(J)

for fast counting, design, 7: 3675(P)

gamma counter for hospital use, design and performance, 7: 2075(J)

high-resolution, with scintillation counters, for prompt and delayed coincidences, design, 7: 3531(J)

large liquid scintillation counters for neutrino detection, 7: 2605

for liquid samples, design, 7: 2072(J)

for measuring high-energy photons and electrons, 7: 3494(J)

for measuring I¹³¹ in thyroid gland studies, 7: 3538(J)

for measuring radioactive contamination of hands and feet, design and operation of, 7: 3160

power supply circuit for, 7: 2033(J)

for radiometric assay of U and Th ores, 7: 2556

for radon and α particle counting, design, 7: 3518

resolution of scintillation spectrometers, 7: 2372(J)

scintillation counter for low-energy electrons, design, 7: 3516(R)

scintillation-type scanner for locating γ emitters administered as tracers to patients and laboratory animals, 7: 2958(R)

spectrum of G-M counter pulses, 7: 3466(R)

spring-driven high-voltage power supply for, 7: 2448(P)

for tracer studies, performance of, 7: 3296(R)

for tracer studies using Co⁶⁰, 7: 3341

wide-range, design, 7: 2615(J)

for x-ray intensity measurements, design of beaded-wire-type, 7: 2319

Radiation detectors

(See also Chemical radiation detectors; Cloud chambers; Fission chambers; Geiger-Mueller tubes; Ionization chambers; Metal foil detectors; Photographic film detectors; Photomultiplier tubes; Pocket chambers; Proportional detectors; Radiation detection instruments; Radioelectric cells; Scintillation detectors; Spark detectors.)

discharge mechanism in, effects on operation and life time of, 7: 2609

electrical field reversing circuit for, for decreasing dead time of, 7: 2452(P)

radiation-sensitive systems capable of serving as a basis for, review and bibliography, 7: 3514(R)

Radiation effects

(See also as subheading under specific materials and organisms.)

on mechanical properties of solids, 7: 1989

review and bibliography, 891 references, 7: 3514(R)

on yeast cells, mathematical analysis of, 7: 2225

Radiation injuries

(See also as subheading under organisms, organs, etc.; see also subheadings under Radiation and specific radiations; see also Radiation damage; Radiation sickness.)

abdominal shielding as protection against, 7: 2729(R)

Radiation injuries (Cont'd)

- to back of hand, anatomical features promoting, **7: 2969(J)**
- diagnostic test for, aminoaciduria as, **7: 2726(R)**
- effects of antibiotic therapy on, in mice, **7: 2741(J)**
- effects of hibernation on, in marmots, **7: 2471(J)**
- effects of infection on lethality following, in mice, **7: 2740(J)**
- effects of streptomycin on infections following, in mice, **7: 2742(J)**
- effects of suprarrenal hormones on hematopoietic regeneration of rats following, **7: 3317(J)**
- factors contributing to, and prophylaxis of, **7: 2739(J)**
- prophylaxis with cysteine, **7: 2737**
- prophylaxis with cysteine, nembutal with cysteine, CaCl_2 , MgCl_2 , formate, tetraethyl ammonium, thiosorbitol, and sarbitol, **7: 2730(R)**
- prophylaxis with injected blood plasma, **7: 2727(R)**
- prophylaxis with liver catalase and various chemical agents, **7: 2729(R)**
- prophylaxis with 2-mercaptoethylamine, **7: 3328(J)**
- prophylaxis with NaCl, **7: 1871**
- prophylaxis with succinonitrile, **7: 1897(J)**
- protective mechanisms, review and bibliography, **7: 2478(J)**
- to radium and x-ray workers over long periods, analysis of examinations, **7: 1896(J)**
- therapy with bone marrow injections, **7: 1899(J)**
- therapy with leukocytosis-promoting factor, **7: 1900(J)**
- therapy with spleen homogenates, **7: 1873**
- from thermal column radiation, prophylactic use of anoxia and glutathione in, **7: 3324**

Radiation Lab., Univ. of Calif., Berkeley

- progress reports on medicine and health physics, **7: 2956(R)**
- progress reports on physics, **7: 2578(R)**

Radiation monitoring

- (The monitoring of radioactivity in work areas, etc.; see also appropriate subheadings under specific sites.)
- manual of personnel monitoring operating techniques, **7: 2239**

Radiation Physics Lab., National Bureau of Standards

- progress reports on ionization chamber response as a function of wall material, **7: 2057(R)**
- progress reports on radiological instrument calibration, **7: 2055(R)**

Radiation sickness

- (See also appropriate subheadings under Radiation and specific radiations; see also physiological headings, e.g., Anemia; see also Radiation injuries.)
- clinical observations on persons exposed to atomic bomb at Hiroshima, summary of, **7: 1901(J)**
- in man, following single exposures, **7: 2734(J)**
- as observed in patients within 30 days following atomic explosion at Nagasaki, review of findings, **7: 3330(J)**
- therapy with bone marrow implants, **7: 3329**

Radiation sources

- (See also main headings for sources of specific radiations, e.g., Alpha sources; see also Radioapplicators.)
- source shapes for teletherapy units, **7: 2031(J)**

Radiation targets

- for bombarding lubricants and refrigerants in cyclotron, **7: 3613(R)**

Radioactivation analysis

- (See Radiometric analysis.)

Radioactive contamination

- (See also subheadings under materials and units contaminated; see also Decontamination; Waste disposal.)
- sampling by smears and adhesive discs, **7: 3326**

Radioactive minerals

- (See also specific radioactive minerals by name, e.g., Pitchblendes.)
- electronic concentration with Lapointe picker belt, **7: 1984**
- occurrence in Ariz., Nev., and N. Mex., **7: 2805(J)**
- occurrence in California, Idaho, Mont., Oreg., Wash., and Wyo., bibliography on, **7: 3438**
- titration of U from, use of liquid emulsions in, **7: 1925**

Radioactive ores

- (See Radioactive minerals.)

Radioactive waters

- in California, Idaho, Mont., Oreg., Wash., and Wyo., bibliography on, **7: 3438**

- effects on capillary permeability, **7: 2474(J)**

Radioapplicators

- (See also Radiation sources.)
- for intercautaneous irradiation, design and performance of, **7: 3336(J)**
- shaped, preparation of, **7: 2454(R)**

Radioautography

- (See also Nuclear emulsions; Photographic film detectors; Radiography.)
- differentiation between malignant and non-malignant melanoblasts by, **7: 2971(R)**

Radioautography (Cont'd)

- modified stripping film technique for, **7: 2458(J)**
- techniques for, in histological studies, **7: 3296(R)**
- of weak α sources, use of spark counter in indirect, **7: 2063(J)**
- wet process system of, **7: 2971(R)**

Radioelectric cells

- for radiation detection, design, **7: 2606**

Radiography

- (See also Photographic film detectors; Radioautography.)
- determination of mass of animal cells by, quantitative technique for, **7: 2744**
- of human body, use of radioisotopes in, **7: 2479(J)**
- techniques resulting in reduced radiation dosage, **7: 3331**
- of tissues, reference system for, **7: 2743**
- of undecalcified bone sections, **7: 2728(R)**

Radioisotope applicators

- (See Radioapplicators.)

Radioisotope Lab., Montefiore Hospital, New York

- progress reports, **7: 2480(R)**

Radioisotopes

- (See also specific radioisotopes.)
- biological effects and dosage determinations of β -emitting, in tissues, **7: 3306**
- distribution in the body, effect of dosage size on, **7: 2985(J)**
- exponential decay, estimation by tenth lives, **7: 2193(J)**
- half-life determinations by delayed coincidences, **7: 2068(J)**
- metabolism, hydrodynamic-model technique for studying, **7: 2984(J)**
- pipetting apparatus for, remotely controlled, **7: 1947**
- purification of rare earth, by ion exchange, **7: 3041**
- in radiography of human body, **7: 2479(J)**
- storage of high-energy-level, facilities for, **7: 2958(R)**
- tracer techniques in agriculture, merits of, **7: 3342**

Radiometric analysis

- (See also as subheading under specific materials.)
- activation analysis, review of, **7: 2504(J)**
- activation analysis, theory, practice, and applications of, **7: 3012(J)**
- method for presenting liquid samples to flat surface of a scintillation crystal, **7: 3170(J)**
- preparation of biological samples for, using Co^{60} as tracer, **7: 3341**
- preparation of samples for, by smears and adhesive discs, **7: 3326**
- trace element determination by neutron radioactivation, **7: 1926(J)**

Radiometric thickness gages

- (See Thickness gages.)

Radiosensitivity

- (See also as subheading under specific organs and organisms; see also appropriate subheadings under organs which influence radiosensitivity.)
- effects of cabbages and carrots in diet on, **7: 1888(J)**
- effects of cysteine on, in bacteria, **7: 2475(J)**
- effects of exposure to cold on, of rats, **7: 2240(J)**
- effects of growth hormone on, in rats and guinea pigs, **7: 1898(J)**
- effects of methyl linoleate on, in rats, **7: 2241(J)**

Radiotherapy

- (See also appropriate subheadings under conditions treated and under specific radiations and radioisotopes used.)
- dosage determinations during rotational, instrument for, **7: 2244(J)**
- shaped radiation source unit for, design, **7: 2031(J)**

Radium

- dosage determinations for implants of, **7: 3296(R)**
- handling, safety measures for, **7: 3479(J)**
- radiometric determination by means of nuclear emulsions, **7: 3517**
- separation from Ba by chromat fractionation procedure, **7: 3035**
- separation from mixture of Ac and Ra, **7: 2440(P)**
- toxicology of, in humans, **7: 2726(R)**

Radium isotopes Ra^{224}

- alpha fine structure intensity, **7: 2690(J)**
- alpha-particle energy, **7: 3274(J)**
- penetration of skin by, methods and radiation effects of, **7: 3318(J)**

Radium isotopes Ra^{226}

- alpha fine structure intensity, **7: 2690(J)**
- alpha-particle energy, **7: 3274(J)**

Radium needles

- (See Radioapplicators.)

Radium plaques

- (See Radioapplicators.)

Radon

- determination in breath, circuit for testing ionization chamber used for, **7: 2592**
- pulmonary absorption and permissible limits of, **7: 2960(R)**
- pulmonary absorption in rats, **7: 2961**
- radiometric determination, pulse type radiation detection instrument for, **7: 3518**

- Radon (Cont'd)**
 toxicology studies of, in U ore mining and milling industry, **7: 2242(J)**
- Radon compounds**
 with p-chlorophenol, synthesis of, **7: 3055(J)**
- Radon isotopes Rn²²⁰**
 absorption by blood corpuscles and plasma, **7: 2254(J)**
 alpha-particle energy, **7: 3274(J)**
 as tracers in self-diffusion studies, **7: 2008(J)**
- Radon isotopes Rn²²²**
 alpha-particle energy, **7: 3274(J)**
 diffusion in nuclear emulsions, **7: 3517**
- Rand ores**
 (See **Uranium ores.**)
- Rare earth bromates**
 optical properties of hydrated, **7: 2696(J)**
- Rare earth complexes**
 with porphyrins, preparation, **7: 2480(R)**
 with sodium salt of deoxyribonucleic acid, preparation, **7: 2480(R)**
- Rare earth compounds**
 absorption spectra, bibliography on, **7: 1952(J)**
- Rare earth minerals**
 fractionation of crude, into mixtures enriched with regard to particular rare earths, **7: 3040**
- Rare earth oxides**
 preparation of very pure, by ion exchange, **7: 3040**
- Rare earths**
 (Lanthanides type 4f; see also specific elements; see also **Actinides.**)
 absorption spectra, bibliography on, **7: 1952(J)**
 anion exchange separation of, **7: 3664(P)**
 chromatographic separation of, **7: 1951(J)**
 ion exchange study of, to determine possible 5f bonding of actinides, **7: 2986**
 precipitation separation with (ethylenediamine)tetraacetic acid, **7: 1953(J)**
 purification by ion exchange, **7: 3041**
 separation of Th from, application of chelating agents in, **7: 2769(R)**
 spectrographic determination in phosphate rock, **7: 2503(J)**
 x-ray emission spectra, multiplicity in, **7: 3050(J)**
- Rate meters**
 logarithmic, design, **7: 2611(R)**
 simple count, as storage element for multichannel analyzers, **7: 3141(R)**
 voltage supply of 0 to 500 v for, circuits, **7: 3140**
 to work from scalars for quick indication of rate counts, design, **7: 3536(J)**
- Rats**
 accumulation, metabolism, and biological effects of astatine in, **7: 2720(J)**
 effects of high explosive blast on mechanically constrained, **7: 3300**
 metabolism of Cs¹³⁷ in, **7: 2943**
 pathological effects of x radiation on weanling and adult, **7: 2959**
 radiosensitivity of, effects of exposure to cold on, **7: 2240(J)**
- Reaction mechanisms**
 (Limited to chemical reaction mechanisms; see also as subheading under specific reactions and materials; see also **Photochemistry**; **Photosynthesis**; **Szillard-Chalmers reaction.**)
 effects of isotopic substitution on, **7: 3496**
- Reactor fuel elements**
 hollow natural U, fast fission factor for, in heterogeneous reactors, **7: 3216(J)**
- Reactor reflectors**
 cooling, determination of hole distribution for, **7: 3213**
- Reactors**
 (See also general headings for types of reactors, e.g., **Graphite moderated reactors.**)
 monitoring with chemical radiation detectors, **7: 2050**
 neutron flux measurements, use of uranium metal-foil detectors in, **7: 3258**
 neutron flux measurements by autoradiography of thin detectors, **7: 3169(J)**
 neutron flux measurements by oxidation of FeSO₄ in H₂BO₃ and in Li₂SO₄ solutions, **7: 2518**
 numerical integration of multi-point boundary problems in age-diffusion equation for, **7: 2397**
 power-level measurement with boron ionization chambers, **7: 2861(J)**
 reactivity, measurement of, **7: 2653(J)**
 relaxation times, comparison of experimental and theoretical data on, **7: 2398(J)**
- Recorders**
 (See **Magnetic recording systems.**)
- Reflection**
 (See as subheading under specific materials and under radiations.)
- Refractory materials**
 (See also specific materials.)
 preparation of, for melting Ti and its alloys, **7: 3425**
 thermal conductivity of, **7: 2552**
- Refrigerants**
 container for, for bombarding in cyclotron to study radiation effects on, **7: 3613(R)**
- Regulators**
 (See **Power supplies**; **Thermostats.**)
- Remote-control equipment**
 (See also **Laboratory equipment**; **Servomechanisms.**)
 manipulator for handling radioactive materials, **7: 2445(P)**
 pipetting apparatus for radioisotopes, **7: 1947**
 servomechanisms for use in, design, **7: 3386**
- Rennselaer Polytechnic Inst.**
 progress reports on decomposition of CO₂ by ionizing radiation, **7: 2778(R)**
 progress reports on diffusion-distillation process for isotope separation, **7: 2847(R)**
- Research Lab. of Electronics, Mass. Inst. of Tech.**
 progress reports, **7: 2590(R)**
- Research programs**
 (See as subheading under headings for corporate authors and under fields of study.)
- Reservoir Mountain (Idaho)**
 uranium distribution, **7: 3441**
- Resin ion exchange**
 (See **Ion exchange.**)
- Resins**
 (See also **Plastics.**)
 absorption of inorganic salts from organic solvents on anion-exchange, **7: 3045(J)**
 behavior of complex metal anions with anion exchange, **7: 2800(R)**
 performance at high flow rates, **7: 2781**
- Resistors**
 radioactive type, design, **7: 2449(P)**
- Resonators**
 (See **Cavity resonators.**)
- Respiration**
 (See also as subheading under tissues, organisms, etc.)
 analysis of respiratory gases, bibliography on, **7: 2718**
 effects of radiation on, of *E. coli*, **7: 2965(J)**
- Rhenium**
 neutron reactions (n,γ), chemical reactions of recoil atoms from, **7: 2520(J)**
- Rhenium isotopes Re¹⁸⁶**
 energy levels following K capture in Os¹⁸⁶, **7: 3632(J)**
- Rhenium isotopes Re¹⁸⁷**
 beta spectrum, **7: 2926(J)**
 beta spectrum and half life, **7: 3509**
 energy levels of, from β decay of W¹⁸⁷, **7: 2929(J)**
- Rhenium isotopes Re¹⁸⁸**
 isomeric states, **7: 2928(J)**
- Rhodium**
 parameters for slow neutron resonance in, **7: 2121**
- Rhodium-iridium alloys**
 wires of, reduction in size by electrolysis, **7: 1991**
- Rhodium isotopes**
 formation of 9-min neutron-deficient positron emitter, **7: 2188(J)**
- Rhodium isotopes Rh¹⁰²**
 preparation of carrier-free, by paper chromatography, **7: 2783(J)**
- Rhodium isotopes Rh¹⁰³**
 gamma scattering cross section, **7: 3612(J)**
 gamma spectra, **7: 2853**
- Rhodium isotopes Rh¹⁰⁴**
 decay of 44-sec and 4.3-min isomers, **7: 2182**
- Rhodium isotopes Rh¹⁰⁶**
 gamma spectra, **7: 2853**
- Ribonuclease**
 urinary excretion of desoxy-, following x irradiation, **7: 2966(J)**
- Ribonucleic acid, desoxy-**
 molecular size, **7: 3185**
- Ribonucleic acid, desoxy- complexes**
 with rare earths, preparation, **7: 2480(R)**
- Ribonucleic acids**
 synthesis of adeninethiomethyl-riboside by yeast, tracer study, **7: 2978**
- Ribonucleotides**
 separation by modified Schmidt-Thannhauser procedure combined with ionophoresis, **7: 2530(J)**
- Richards Mineral Engineering Lab., Mass. Inst. of Tech.**
 progress reports on adaptation of new research techniques to mineral engineering problems, **7: 2800(R)**

- Roasting
(See as subheading under ores roasted.)
- Rock drilling
with oil-base mud or air as the circulating medium, **7: 3082(R)**
techniques used on Colorado Plateau, **7: 3431**
- Rock salt
(See Sodium chlorides.)
- Rocks
age estimations, **7: 1983**
radioactive inclusions in granite of Ploumanac'h, France, **7: 1985(J)**
- Rolling
(See as subheading under specific materials.)
- Roots
effects of neutrons, tryptaflavine, and plant extracts on mitoses in vegetative tips of, **7: 1886(J)**
- Rubber
(See also specific elastomers; see also Elastomers; Plastics.)
decontamination of gloves of, **7: 2738(R)**
effects of radiation on, **7: 2919(R)**
effects of radiation on hardness and tensile strength, **7: 3614(R)**
- Rubidium chloride-potassium chloride systems
x-ray-induced F bands in mixed crystals, **7: 2421(J)**
- Rubidium isotopes Rb⁸²
decay schemes, low-energy portion of, **7: 3260**
half-life and isomerism, **7: 3264(J)**
- Rubidium isotopes Rb⁸⁴
isomer, half life and energy levels of, **7: 2147(J)**
- Rubidium isotopes Rb⁸⁶
beta-gamma angular correlations of, multipole interference effects in, **7: 3279(J)**
nuclear spins and magnetic moments, **7: 3207(J)**
- Rubidium isotopes Rb⁸⁷
beta spectra and half life, **7: 3509**
gamma reactions (γ, n), cross sections for, **7: 2403(J)**
- Rust
(See Corrosion.)
- Rutgers Univ., Coll. of Engineering
progress reports on crystal imperfections of polycrystalline materials, **7: 3097(R)**
- Ruthenium isotopes Ru⁹⁶
mass difference of Mo⁹⁸ and, **7: 2045(J)**
- Ruthenium isotopes Ru¹⁰³
gamma spectra, **7: 2853**
- Ruthenium isotopes Ru¹⁰⁶
gamma spectra, **7: 2853**
- Rutin
biosynthesis of C¹⁴-labeled, **7: 2728(R)**
- S**
- S particles
(See also Mesons (κ); V particles.)
production in cosmic-ray stars, **7: 2090(J)**
- Saccharose
(See Sucrose.)
- Saclay reactor
heavy water level indicator for, **7: 2034(J)**
reactivity, measurement of, **7: 2653(J)**
- Salicylic acid, thio-
oxidation-reduction reactions with cations and anions, **7: 2498(R)**
- Salivary glands
radiosensitivity of, **7: 3309(J)**
- Salt Wash member
petrographical investigations and exploration of, **7: 3436(R)**
- Salt Wash Member (Colo.)
prospecting and petrology, **7: 2557**
- Salt Wash Member (Utah)
prospecting and petrology, **7: 2557**
- Samarium
electrochromatographic separation of, **7: 1955(J)**
fluorimetric determination, **7: 2255**
preparation by distillation from La, **7: 3034**
- Samarium isotopes
electromagnetic concentration, **7: 2356**
- Samarium isotopes Sm¹⁴⁶
identification, **7: 2356**
- Samarium oxide-uranium oxide systems
phase studies, **7: 2536(J)**
- Sampling
of eluates, automatic system for, **7: 2611(R)**
- San Rafael Swell (Utah)
7: 2558
exploration, **7: 3434**
- San Rafael Swell Area (Utah)
geophysical exploration by subsurface isorad methods in, **7: 3078**
- Sand Pebble Field Area (Fla.)
petrology, **7: 3081**
- Sandstone deposits (Utah)
geology, **7: 2555**
- Sarah Mellon Scaife Radiation Lab., Univ. of Pittsburgh
progress reports on radiation damage studies, **7: 2919(R), 3613(R), 3614(R)**
- Scalers
cold-cathode, circuits for, **7: 2617(J)**
cold-cathode "Dekatron," design, **7: 2611(R)**
for pulse-type radiation detection instruments, design, **7: 2038(J)**
- Scandium
electrochromatographic separation of, **7: 1955(J)**
extraction from minerals, and purification, **7: 2271(J)**
ion-exchange separation, **7: 2784(J)**
neutron transmission, **7: 3107(R)**
thermal neutron absorption cross section of, **7: 2135(J)**
- Scandium isotopes Sc⁴⁶
thermal neutron scattering cross section, **7: 2009(R)**
- Scandium isotopes Sc⁴⁸
decay schemes, **7: 3275(J)**
production from Sc₂O₃, neutron capture cross section for, **7: 3200(J)**
- Scandium isotopes Sc⁴⁸
decay schemes, **7: 3107(R), 3277(J)**
- Scandium oxide-uranium oxide systems
phase studies, **7: 2536(J)**
- Scattering
(See as subheading under specific particles and radiations.)
- Scintigrams
(See Scintillation detectors.)
- Scintillation counters
(See Radiation detection instrument (pulse type); Scintillation detectors.)
- Scintillation detectors
(See also Phosphors.)
for alpha and γ detection, **7: 2611(R)**
anthracene and stilbene, for n-p scattering measurements, **7: 2910(J)**
application to C¹⁴ detection, **7: 2067(J)**
bibliography on, **7: 2852**
coincidence circuits for, design, **7: 2374(J)**
development of, review emphasizing radiobiological applications, **7: 2852**
effects of surface effect on NaI crystals used as, **7: 3511**
efficiency of anthracene, for low-energy electrons, **7: 3525(J)**
extended-source, design, **7: 3171(J)**
gamma-ray detection with, correction for Compton electron production and backscattering, **7: 3532(J)**
for iodine (¹³¹I) detection in thyroid gland and production of a scintigram, **7: 1907(J)**
liquid, in determination of activities of tritium-labeled materials, **7: 2373(J)**
lithium iodide crystal, for slow neutrons, **7: 2362**
1-naphthylborine as, **7: 2069(J)**
organic phosphors as dosimeters in x-ray region, **7: 2083(J)**
response of liquid, to neutrons, **7: 3107(R)**
shape and duration of voltage pulse from photomultiplier attached to, calculation of, **7: 2074(J)**
techniques for presenting liquid samples to flat surface of, **7: 3170(J)**
testing of efficiency of, synthesis of standard sample of C¹⁴-labeled benzoic acid for, **7: 2992**
voltage supply of 500 to 1800 v for, circuits, **7: 3140**
well logging unit type TU-5-A, design, **7: 2300**
- Scintillators
(See Phosphors.)
- Scintillongs
(See Radiation detection instruments (ion current type.))
- Scrap recovery
(See appropriate subheadings under specific materials.)
- Scrubbers
(See also Extraction apparatus.)
performance, **7: 2542(R)**
- Sea water
sampling, apparatus for, **7: 3429(R)**
- Seals and glands
(See also Vacuum seals.)
paste for sealing electric outlets, etc., at liquid-He temperature, **7: 2289(J)**

- Secondary emission
(See appropriate subheadings under Electrons.)
- Sedimentary deposits (Colo.)
sampling, 7: 2557
- Sedimentary deposits (U. S.)
occurrence, 7: 2559
- Sedimentary deposits (Utah)
sampling, 7: 2557
- Sedimentation
in slurries, automatic recording balance for measurement of, 7: 2996
- Seed
(See also specific plants.)
sensitivity of barley, to fast neutrons and x radiation, 7: 2735(J)
- Selenides
superconductivity of, 7: 3454(R)
- Selenium
neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, 7: 2875
thermodynamic properties, 7: 3456(R)
x-ray absorption spectra, 7: 2319
- Selenium fluorides
molecular structure, infrared spectra, and thermodynamic properties of, 7: 3547
- Selenium isotopes Se^{78}
internal conversion and photoelectric spectra of, 7: 2605
- Selenium isotopes Se^{77}
nuclear magnetic moments, 7: 2649(J)
- Self-diffusion
(See also as subheading under specific materials.)
theory of D_0 in Arrhenius equation for, in cubic metals, 7: 3088
tracer studies using Rn^{220} , 7: 2008
- Semi-conductors
(See also specific materials; see also Electric conductivity.)
a-c space-charge polarization effects in, theory, 7: 3467
- Septicemia
effects of sublethal irradiation on susceptibility to, 7: 3305
- Serpentine Area (Alaska)
geology, mineralogy, and exploration, 7: 3440
- Servomechanisms
(See also Cybernetics; Laboratory equipment; Remote-control equipment.)
for remote manipulation, design and performance of, 7: 3386
- Sewage
(See also Waste processing; Waste disposal.)
decontamination, papers presented at South District Filtration Plant, Chicago, Sept. 1952, 7: 2799
effects of radiation on biochemical oxidation in, 7: 3303
- Seward Peninsula (Alaska)
exploration, 7: 3440
prospecting, 7: 3083
prospecting for radioactive deposits in, 7: 1982
- Shale deposits (Tenn.)
analysis, mineralogy, and petrology, 7: 2299(R)
- Shale deposits (Utah)
geochemistry, 7: 3434
- Shales
radioactivity of ampetitic schists of northern France, 7: 2301(J)
- Sheep
metabolism of Cs^{137} in, 7: 2943
- Shielding materials
(See also specific materials.)
interlocking concrete and Pb blocks for, 7: 2697(J)
Portland cement concretes for use as, 7: 2425
- Shinarump Formation (Utah)
geology and mineralogy, 7: 2558
- Shipping
(See appropriate subheadings under specific materials.)
- Shock
(See appropriate subheadings under specific materials.)
- Shock waves
compression of γ -law gas by, 7: 2345
from high explosive blast, effects on lungs, 7: 3300
- Showers
(See as main heading by name of radiation inducing showers, e.g., Cosmic showers; see Cascade showers.)
- Shutters
(See Cameras.)
- Sickle cells
(See Erythrocytes.)
- Sight
(See Vision.)
- Silica gel
(See Silicon oxides (colloidal).)
- Silicon
naturally-occurring, search for Si^{32} in, 7: 3504(J)
neutron total cross sections, in 3- to 12-Mev region, 7: 2123(J)
- Silicon alcoholates
physical properties and structural chemistry, 7: 1919(J)
reactions with acetyl chlorides, 7: 1921(J)
- Silicon-aluminum systems
effects of radiation on electric conductivity and hardness of, 7: 2306
- Silicon carbide crucibles
properties and fabrication, 7: 3076
- Silicon chlorides
microwave spectrum and structure of SiD_3Cl , 7: 3375(J)
- Silicon fluorides
microwave spectrum and structure of SiD_3F , 7: 3378(J)
- Silicon isotopes Si^{27}
mass difference of Al^{27} and from $\text{Al}^{27}(\text{p},\text{n})\text{Si}^{27}$ threshold, 7: 2126(J)
- Silicon isotopes Si^{28}
decay schemes, 7: 2141(J)
- Silicon isotopes Si^{29}
nuclear magnetic moments, 7: 2649(J)
spins of excited states from (d,p) stripping, 7: 2136(J)
- Silicon isotopes Si^{31}
formation, from proton bombardment of Cl_2 , 7: 2687(J)
- Silicon isotopes Si^{32}
abundance in natural Si, 7: 3504(J)
- Silicon oxide crucibles
properties and fabrication, 7: 3076
- Silicon oxides
spectrophotometric determination in the ultraviolet, 7: 3465(R)
- Silicon oxides (colloidal)
infrared spectra of D_2O adsorbed on, 7: 3019(J)
- Silver
adsorption on silver sulfides, 7: 2800(R)
alpha reactions, analysis of secondary particles from, 7: 2656
bremsstrahlung reactions (γ,α), energy spectrum, 7: 2405(J)
determination by its catalytic effect, 7: 2255
electrochromatographic separation from Cu and Ni, 7: 3036
gamma reactions (γ,p), 7: 3221
grain-boundary self-diffusion in, 7: 2568(R), 3456(R)
neutron transmission, 7: 3519
proton scattering by, 7: 3605(J)
- Silver bromides
physical effects of electron bombardment on, 7: 2178(J)
- Silver-copper alloys
effects of radiation on electric conductivity and hardness of, 7: 2306
- Silver crystals
thermoelectric properties, 7: 2590(R)
- Silver films
electric properties, 7: 2318(R)
- Silver isotopes Ag^{108}
alpha reactions (α,n) and ($\alpha,2\text{n}$), excitation curves, 7: 3585
alpha reactions (γ,n) and ($\alpha,2\text{n}$), excitation curves and cross sections for, 7: 3219
- Silver isotopes Ag^{110}
decay schemes, coincidence studies with scintillation spectrometers, 7: 2374(J)
- Silver sulfides
adsorption of silver and sulfide ions on, 7: 2800(R)
phase studies in temperature range 160 to 300°C, 7: 3453
- Simulators
(See equipment or processes, and component or characteristic simulated; see Computers.)
- Sintering
(See also as subheading under specific materials.)
mechanism of, 7: 3099(R)
theory, 7: 3424
- SIR
(See Submarine intermediate reactor.)
- Skin
decontamination, evaluation of agents for, 7: 1894(J)
effects of flash thermal radiation on white and negro, 7: 2229(J)
effects of ThX (Ra^{224}) radiations on, 7: 3318(J)
effects of x radiation on rabbit, 7: 1891(J)
phospholipid changes in, induced by exposure to thermal radiation, 7: 2962
radioautography of, histologic techniques in, 7: 2243
tumors of, induced by subcarcinogenic dose of β radiation followed by applications of croton oil, 7: 2950

Slip

(See as subheading under specific materials.)

Sloan-Kettering Inst. for Cancer Research
progress reports, **7: 3295(R)**

Slow neutrons

(See Thermal neutrons.)

Slurries

sedimentation in, automatic recording balance for measurement of,
7: 2996

Sodium

colorimetric analysis for B by alcohol extractions, **7: 2765**
diffusion into Na tungsten bronze, **7: 2318(R)**
metabolism, tracer study, **7: 3296(R)**
metabolism in alga *Ulva lactuca*, **7: 1861**
nuclear electric quadrupole moment, **7: 2590(R)**
self-diffusion coefficient in NaCl, effect of x irradiation on, **7: 2920(J)**
solubility of Fe in, **7: 3452**
spectra, detection of nuclear spin in forbidden components of Zeeman
effect in, **7: 2650(J)**

Sodium (gaseous)

specific heat of, method of measurement, **7: 2825(R)**
surface ionization detector for, **7: 2349**

Sodium (liquid)

critical temperature, apparatus for determination of, **7: 2351(R)**
electromagnetic flowmeter for, design and calibration of, **7: 2307**

Sodium acetates

synthesis of tritium-labeled, **7: 3296(R)**

Sodium azides

effects on radioinduced protein coagulation, **7: 3314(J)**

Sodium carbonates

epithelial reactions of recoil atoms in, **7: 3389**

Sodium chloride crystals

effects of x radiation on coloration and internal friction of, **7: 2179(J)**

Sodium chloride-lithium chloride systems (liquid)

decomposition potential, **7: 3101(R)**

Sodium chloride-sodium fluoride systems (liquid)

corrosive effects on Ti, **7: 3092(R)**

Sodium chloride-zirconium(IV) chloride systems

fusion, **7: 2560**

Sodium chlorides

diffusion and migration of Cs¹³⁷ ion in, **7: 1961(J)**
radiosensitivity effects on mice, **7: 1871**
silver-activated, α -particle induced phosphorescence of, **7: 3256(J)**

Sodium chlorides (liquid)

corrosive effects on Ti, **7: 3092(R)**

Sodium fluoride-sodium chloride systems (liquid)

corrosive effects on Ti, **7: 3092(R)**

Sodium fluorides

fluorescence of U in, quenching action of Fe and Pu on, **7: 3156**
rheological properties at elevated temperatures, **7: 3073**
sintering of, **7: 3424**

Sodium hydroxides

solubility of Fe in, **7: 3452**

Sodium hydroxides (liquid)

corrosive effects on Ni and Au, **7: 2553(R)**
forced-convection heat transfer in molten, **7: 2546**

Sodium iodide crystals

efficiency in scintillation detection, influence of surface effect on,
7: 3511

Sodium iodides

gamma absorption and scattering, **7: 2009(R)**

Sodium isotopes

mass, **7: 3150(J)**

Sodium isotopes Na²²

positron spectra, and decay constant for decay to Ne²² ground state,
7: 3262(J)

preparation of carrier-free, by paper chromatography, **7: 2783(J)**
separation from Mg target by electrolysis, **7: 3059(J)**

Sodium isotopes Na²³

alpha reactions (α, γ), coincidence measurements of, **7: 3617(J)**
proton reactions (p, γ), **7: 2141(J)**

Sodium isotopes Na²⁴

half life, **7: 2688(J)**
nuclear spins and magnetic moments, **7: 3207(J)**
quantitative estimation of, when mixed with P³² in body fluids and tissues,
7: 2248(J)

Sodium nitrides

decomposition by radiation, **7: 3395(J)**

Sodium oxides

preparation from system Na-H₂-NaOH-Na₂O, **7: 3351**
solubility of Fe in, **7: 3452**

Sodium-potassium alloys

burns of skin from, protection and therapy, **7: 2726(R)**

Sodium-potassium alloys (liquid)

effects of wetting on heat transfer characteristics of, **7: 3412**

Sodium sulfates

action of F₂ on, **7: 2515(J)**

diffusion in aqueous solutions, effects of pressure on, **7: 2757**

Sodium sulfites

action of F₂ on, **7: 2515(J)**

Sodium thiosulfates

action of F₂ on, **7: 2515(J)**

Sodium tungsten bronze

electric properties and diffusion of Na into, **7: 2318(R)**

Soil

moisture determination in, by neutron scattering, **7: 2863(J)**
properties affecting uptake of fission products by plants, tracer study and
radiometric analysis, **7: 2489**

Solid-State and Molecular Theory Group, Mass. Inst. of Tech.

progress reports, **7: 2429(R), 3550(R)**

Solids

effects of radiation on mechanical properties of, **7: 1989**

Solvent extraction processes

(See also subheadings under material being extracted; see also main
headings for processes by name.)

cycle analysis, mathematical, **7: 3397**

double, diagrams for determining operating conditions in two-component
separations, **7: 2275(J)**

Solvent properties

(See as subheading under specific materials used as solvents.)

Sommerville Formation (Utah)

geology, **7: 2555**

Sounding balloons

barometer unit for, **7: 2593(J)**

South African ores

(See main headings by material of interest, e.g., Uranium ores, and by
mineral, e.g., Pitchblendes.)

Spark detectors

application to radioautography of weak α sources, **7: 2063(J)**

Specific heat

(See also as subheading under specific materials.)

of fluids, methods and apparatus for measurement of, **7: 2825(R)**

Spectra

(See also as subheading under specific materials; also subheadings for
types of spectra by radiation; see also main headings by name of radi-
ation, e.g., Gamma spectra.)

electronic paramagnetic resonance, review, **7: 2646(J)**

Spectrometers

(See also main headings for spectrometers by name of radiation or
particles, e.g., Beta spectrometers; see also Mass spectrometers.)
counting response of crystal, **7: 3141(R)**

Spectrophotometric analysis

application to oxidation-reduction titrations, and effect of anion character
on, **7: 2255**

Spectroscopy Lab., Ill. Inst. of Tech.

progress reports on molecular spectroscopy, molecular structure, and
thermodynamics of substituted methanes, **7: 3401**

Sperm

effects of x radiation on fertility of sea urchin, **7: 3312(J)**

Sphalerites

absorption of Cu on, and its desorption by NaCN and Na₂S, **7: 2800(R)**

Sphenes

radioactivity and U content of, in granite from Ploumanach, France,
7: 1985(J)

Spin

(See as subheading under fundamental particles.)

Spleen

effects of radiation on, **7: 2726(R)**

effects of x irradiation of exteriorized, on red-blood-cell count in mice,
7: 2473(J)

radiosensitivity effects, in mice and rats, **7: 2953**

radiosensitivity effects of shielding, **7: 2730(R)**

shielding and removal of, effects on antibody formation in x irradiated
rats, **7: 3320(J)**

Stainless steel

corrosion by liquid Li, **7: 2295, 2303**

corrosion by liquid Li and Na at 1000°C, **7: 2312(J)**

corrosion resistance in organic compounds, **7: 3427(J)**

creep and stress rupture of, **7: 2811**

stress-rupture and corrosion tests in liquid Bi-Pb alloy, **7: 2566(R)**

Standard Oil Co. of Ind.

progress reports on a grease for use at -65°F to +450°C, **7: 2797(R)**

- Stanford Research Inst.
progress report on protective role of the spleen in radiation injury, **7: 2953(R)**
- Stanford Univ.
progress reports on constituents in Calif. beach sands, **7: 3435(R)**
- Star production
(See appropriate subheadings under specific radiations and under Nuclear emulsions; see Photographic film detectors.)
- Stars
(See also Sun.)
energy production in, by p-p cycle, **7: 2012(J)**
- Statistical analysis
(See as subheading under specific processes and situations analyzed.)
- Statistical mechanics
(See Mathematics; Thermodynamics.)
- Stearic acid
adsorption on steel surfaces, tracer study, **7: 3046**
labeled with C^{14} , use in surface research of various materials, **7: 2789(J)**
- Steel
(See also Carbon steel; Stainless steel.)
corrosion by liquid Bi, **7: 2296**
creep and stress-rupture of, **7: 2811**
effects of stress concentration and triaxiality on plastic flow of, **7: 3421**
notched bar impact properties of quenched and tempered, effects of C, P, and alloy contents on, **7: 3423**
passivation by stearic acid, tracer study, **7: 3046**
strain aging and rheotropic recovery, **7: 3420**
strain energy absorption in, **7: 2800(R)**
x-ray absorption in, **7: 2322**
- Steel wool
gamma backscattering, **7: 2896**
- Sterilization
(See also as subheading under specific materials sterilized.)
of food, by γ radiation, **7: 2721**
- Sterols
effects on cholesterol metabolism, **7: 1862(R)**
- Stilbene
synthesis of tritiated trans-stilbene, **7: 1958(J)**
- Stills
(See Distillation apparatus.)
- Storage and shipping
(See appropriate subheadings under specific materials.)
- Storage batteries
cathodic polarization associated with oxygen electrodes in, **7: 2759**
low-temperature testing of, **7: 2611(R)**
- Strain hardening
(See as subheading under specific materials.)
- Streptomycin
protective effects against post-irradiation infections in mice, **7: 2740(J)**, **2741(J)**, **2742(J)**
- Stress analysis
(See also appropriate subheadings under materials and units stressed.)
linear time-temperature relation for extrapolation of creep and stress-rupture data, **7: 2811**
- Stress and strain
(See as subheadings under specific materials; see Materials testing.)
- Stress corrosion
(See as subheading under specific materials.)
in aluminum-Cu alloys, measurement and theory, **7: 3426**
- Strontium isotopes
abundance in minerals, and suitability for use in mineral-age estimations, **7: 2040(J)**
- Strontium isotopes Sr^{82}
half-life, **7: 3264(J)**
- Strontium isotopes Sr^{86}
neutron capture cross section for production of, **7: 3200(J)**
- Strontium isotopes Sr^{88}
directional correlation of γ 's from, and angular momenta of levels of, **7: 2878**
- Strontium isotopes Sr^{91}
decay schemes, **7: 2654**
- Strontium sulfates
crystal growth from solution, **7: 2263(R)**
- Strontium titanates
x-ray spectra, **7: 2933(R)**
- Styrene polymer-uranium oxide systems
analysis, **7: 1923**
- Styrene polymers
electric conductivity, **7: 2052(R)**
fluorinated, synthesis and polymerization, **7: 3027(J)**
- Styrene polymers (Cont'd)
radiation chemistry, **7: 3392(R)**
radioinduced crosslinking in, solubility and molecular size distribution of, **7: 3252**
swelling properties of polystyrene crosslinked by high-energy radiation, **7: 3253**
- Styrenes
polymerization by β particles, **7: 3032(J)**
polymerization by radiation, **7: 2317(R)**
- Sublimation
apparatus for fractional, design, **7: 2438(P)**
- Submarine intermediate reactor,
mercury as coolant in, medical hazards of, **7: 2246**
- Subsonic flow
(See also Fluid flow; Gas flow.)
three dimensional, moment formula in, **7: 3415(J)**
turbulent wake development behind cylinders in low-speed, **7: 2547**
- Succinates
thorium complexes of, **7: 3003(J)**
- Succinic acid, amino-
(See Aspartic acid.)
- Succinonitriles
radiosensitivity effects on rats, **7: 1897(J)**
- Sucrose
biosynthesis of C^{14} -labeled, **7: 2728(R)**
- Sugars
(See also specific sugars.)
phosphates in, separation by ion exchange using borate complex, **7: 3398(J)**
- Sulfates
action of F_2 on, **7: 2515(J)**
- Sulfhydryl group
(See Mercapto group.)
- Sulfide crucibles
properties and fabrication, **7: 3076**
- Sulfides
adsorption on silver sulfides, **7: 2800(R)**
electrochemical properties, **7: 2800(R)**
- Sulfites
action of F_2 on, **7: 2515(J)**
- Sulfonation
(See as subheading under specific materials.)
- Sulfur
entropy and heat of formation, **7: 2828**
incorporation into corpus luteum, autoradiographic detection using S^{38} , **7: 2251(J)**
 π -meson production in, by cosmic rays, **7: 2833(J)**
neutron total cross sections for 3- to 12-Mev neutrons, **7: 2123(J)**
neutron total cross sections for 14-Mev neutrons, **7: 2871(J)**
tissue distribution of, radioautographic techniques for studying, **7: 2981**
toxic action on fungus spores, **7: 2484**
- Sulfur dioxides
oxidation of, effects of radiation on rate of, **7: 3393**
- Sulfur fluorides
separation of SO_2F_2 from SF_6 and SOF_2 , **7: 2514(J)**
vapor pressure of SO_2F_2 , **7: 2514(J)**
- Sulfur isotopes S^{33}
nuclear magnetic moments, **7: 2649(J)**
nuclear magnetic moments of, from microwave spectroscopy, **7: 2388**
spins of excited states from (d,p) stripping, **7: 2136(J)**
- Sulfur isotopes S^{35}
beta spectra, **7: 2318(R)**
- Sulfuric acid
self-diffusion, effects of pressure on, **7: 2989**
- Sun
(See also Stars.)
deuterium abundance in, **7: 2331(J)**
- Supersonic flow
(See also Fluid flow; Gas flow.)
of thermally insulated viscous gas through nozzle, **7: 3070(J)**
- Surface activity
radioactive monolayers in study of, **7: 2789(J)**
- Surface friction
of laminar boundary layer, effect of thermal properties on, **7: 2794**
- Surface properties
(See as subheading under specific materials.)
- Survey meters (radiation)
(See Radiation detection instruments (ion current type); Rate meters.)
- Suspensions
(See also as main heading by name of material suspended.)
preparation by introducing into the liquid a mixture of solid CO_2 and the material to be dispersed, **7: 3678(P)**

- Swaging
(See as subheading under specific materials.)
- Sweepstakes Creek Area (Alaska)
prospecting, geology, geography, and mineralogy, **7: 3083**
- Swine
lethal ($LD_{50/30}$) radiation dosage determinations, **7: 2731(R)**
metabolism of Cs^{137} in, **7: 2943**
- Synchrocyclotrons
ion source for 184-in., **7: 3599**
- Synchrometers
(See Mass spectrometers.)
- Synchrosopes
(See Oscillographs.)
- Synchrotrons
(Varying magnetic field electron accelerators; see also Brookhaven synchrotron; Proton synchrotrons.)
beam characteristics, from study of induced activity of targets, **7: 3601(J)**
focusing methods for, **7: 2668(J)**
magnet construction for auxiliary betatron, **7: 2162(J)**
operating principles, review, **7: 2669(J)**
photon beam from Berkeley, r-f fine structure of, **7: 2156**
- Synthesis
(See appropriate subheadings under specific materials.)
- Synthetic rubber
(See Elastomers.)
- Szillard-Chalmers reactions
(See also as subheading under specific materials.)
nuclear isomers resulting from, separation by ion exchange, **7: 1949(J)**
- T**
- Tables
(See as subheading under the specific property.)
- Tachometer
mechanical-electronic type, design, **7: 2450(P)**
- Tantalum
activation determination in ferroniobiums and Nb minerals, **7: 3368(J)**
chromatographic separation from Nb on activated alumina, **7: 3044(J)**
corrosion embrittlement in HCl, **7: 3428(J)**
photon reactions (γ, p), **7: 2318(R)**
solubility of O in, **7: 3104(J)**
- Tantalum-aluminum-titanium alloys
constitution diagrams and mechanical properties, **7: 3458**
- Tantalum complexes
with chloride, tartrate and fluoride, spectra of, **7: 2785**
- Tantalum isotopes Ta^{181}
gamma reactions ($\gamma, 2n$), cross sections for, **7: 2155(J)**
internal conversion, **7: 2873(R)**
isomeric states and energy levels, **7: 3531(J)**
- Tantalum oxides
crystal structure, **7: 3104(J)**
- Tantalum-titanium alloys
constitution diagrams and mechanical properties, **7: 3458**
- Tantalum-zirconium alloys
corrosion embrittlement in HCl, **7: 3428(J)**
tensile properties of, up to 300°C, **7: 3457(R)**
- Tape recorders
(See Magnetic recording systems.)
- Targets
(See Radiation targets.)
- Technetium
solvent extraction of, as tetraphenylarsonium pertechnetate, **7: 2274(J)**
- Technetium isotopes Tc^{99}
isomeric transition in, **7: 2185(J)**
- Technetium isotopes Tc^{99}
decay schemes, **7: 2185(J)**
- Technetium isotopes Tc^{101}
decay schemes, **7: 3348(R)**
- Technetium isotopes Tc^{122}
decay schemes, **7: 3348(R)**
- Technical Operations, Inc.
progress reports on use of transistors in radiac survey meters, **7: 2363(R)**
- Teeth
phosphorus metabolism in, tracer study in rats and hamsters, **7: 2492(J)**
- Telemetry systems
for Van de Graaf accelerator, design, **7: 2667(J)**
- Television tubes
(See Cathode-ray tubes.)
- Teller Area (Alaska)
prospecting for radioactive deposits in, **7: 1982**
- Tellurium
colorimetric analysis for I, **7: 3146**
neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, **7: 2875**
thermodynamic properties, **7: 3456(R)**
- Tellurium fluorides
molecular structure, infrared spectra, and thermodynamic properties of, **7: 3547**
- Tellurium isotopes Te^{123}
nuclear magnetic moments, **7: 2649(J)**
- Tellurium isotopes Te^{125}
nuclear magnetic moments, **7: 2649(J)**
- Tellurium isotopes Te^{126}
nuclear energy levels, **7: 2923(J)**
- Temperature
effects of exposure to cold on radiosensitivity of rats, **7: 2240(J)**
- Temperature effects
(See as subheading under specific materials and properties affected.)
- Temple Mountain Area (Utah)
geophysical exploration by subsurface isorad methods, **7: 3078**
- Temple Mountain District (Utah)
geophysical exploration, **7: 3431**
- Tenderfoot Mesa (Colo.)
geophysical exploration, **7: 3431**
- Tennessee Univ.
progress reports on agricultural research, **7: 2731(R)**
- Tensile properties
(See also as subheading under specific materials.)
of ternary α solid solutions, validity of additive law for, **7: 2564**
- Terbium fluorides
crystal structure and preparation, **7: 3110**
- Testes
(See Gonads.)
- Testosterone
metabolism and excretion of, tracer study, **7: 2979**
- Thallium
electrodeposition at a Hg cathode, **7: 2255**
spectrophotometric determination with HCl, **7: 3363(J)**
- Thallium-indium alloys
diffusionless phase changes in, **7: 2305(R)**
- Thallium isotopes Tl^{204}
half life, **7: 2688(J)**
- Thallium isotopes Tl^{208}
half life, **7: 2391(J)**
- Thallium isotopes Tl^{207}
half life, **7: 2391(J)**
- Thallium nitrates
diffusion in aqueous solutions, effect of pressure on, **7: 2988**
- Thenoyltrifluoroacetone
(See Acetone, thenoyltrifluoro-.)
- Therapy
(See as subheading under condition treated and under agent used.)
- Thermal analysis
(See as subheading under specific materials.)
- Thermal capacity
(See as subheading under specific materials.)
- Thermal conductivity
(See also as subheading under specific materials; see also Heat transfer.)
of liquids, transient methods for determining, **7: 3064**
measurement at liquid H temperature, **7: 2549**
of refractory materials, measurement of, **7: 2552**
- Thermal convection
(See Convection.)
- Thermal cycling apparatus
for study of effects of cyclic thermal stresses on ductile metals, **7: 2029**
- Thermal decomposition
(See as subheading under specific materials.)
- Thermal dissociation
(See thermal decomposition as subheading under specific materials.)
- Thermal emission
(See appropriate subheadings under Electrons.)
- Thermal expansion
(See as subheading under specific materials.)
- Thermal injuries
(See Burns.)
- Thermal insulation
effects of radiation on, **7: 3254**

Thermal neutrons

- density distribution in semi-infinite scattering medium, **7: 3248(J)**
- detection of, scintillation detector for, **7: 2362**
- lethal-dosages for mice compared with lethal x-radiation dosages, **7: 1870**
- mixed with γ radiation in thermal column, pathological effects of, **7: 3324**
- relaxation length of point source of, in H_2O , **7: 3552(J)**
- scattering by bound protons and deuterons, differential cross sections for, **7: 2167(J)**
- scattering of, plural and multiple corrections to, **7: 2166(J)**
- scintillation detection with 1-naphthylborine, **7: 2069(J)**

Thermal precipitators

- (See also **Particle precipitators.**)
- oscillating, performance of, **7: 2261**

Thermal properties

- (See also as subheading under specific materials.)
- measurement, high-temperature furnaces for, **7: 2281**
- measurement at high temperatures, design of equipment for, **7: 2268(R)**

Thermal radiation

- (See also **Heat transfer.**)
- carbon arc source of, monitoring of, **7: 2324**
- effects of burns from, combined with total-body x irradiation, on mice, **7: 2724**
- effects of flash, on white and negro skin, **7: 2229(J)**
- phospholipid changes in skin following exposure to, **7: 2962**
- in presence of absorbing and diffusing medium, functional equations of, **7: 2327(J)**

Thermal reactors

- (See also specific thermal reactors.)
- induction of secondary fusion reactions with, **7: 2651(J)**
- production of fissionable isotopes in, theoretical considerations regarding, **7: 2395**

Thermal stresses

- in cylinders of infinite and finite heights, calculation of, **7: 3109**

Thermionic emission

- (See appropriate subheadings under **Electrons** and under specific materials.)

Thermodynamic properties

- (See as subheading under specific materials.)
- of ideal gases, effect of isotopic substitution on, **7: 3496**

Thermodynamics

- (See also subheadings concerning thermodynamic properties under specific materials.)
- relativistic statistical, **7: 2706(J)**
- thermodynamic activity and the miscibility gap, theory, **7: 3353**

Thermopiles

- for neutron flux distribution measurements, design, **7: 2051**

Thermostats

- design, **7: 3141(R)**
- for magnetic resonance absorption studies, design, **7: 3459(R)**
- r-f energy regulator for high temperature control in thermodynamic measurements, **7: 2350**

Thickness gages

- liquid-level indicators as, **7: 2034(J)**

Thiols

- conductometric determination of, and oxidation-reduction reactions, **7: 2498(R)**

Thiosulfates

- action of F_2 on, **7: 2515(J)**

Thiouracil

- (See **Uracil, 2-thio-.**)

Thoria

- (See **Thorium oxides.**)

Thorium

- cold drawing of Th wire, **7: 2806**
- hardness of Ames, **7: 3090**
- neutron resonances, **7: 2009(R)**
- neutron total cross sections, **7: 3205(J)**
- neutron total cross sections as function of neutron energy from 0.1 to 3 Mev, **7: 2875**
- position in periodic system, **7: 3004(J)**
- separation from mixture of Ac and Th, **7: 2440(P)**
- separation of rare-earths from, application of chelating agents in, **7: 2769(R)**
- spectrographic determination in phosphate rock, **7: 2503(J)**
- spectrophotometric analysis for Fe, **7: 3008**
- spectrophotometric determination in black sands, **7: 3007**
- thermal conductivity, **7: 2318(R)**

Thorium complexes

- with phthalates, malonates, succinates, and maleates, **7: 3003(J)**

Thorium deposits

- in California, Idaho, Mont., Oreg., Wash., and Wyo., bibliography on, **7: 3438**

Thorium deposits (Alaska)

- occurrence, **7: 2801**

Thorium isotopes Th^{228}

- alpha fine structure intensity, **7: 2690(J)**
- alpha-gamma angular correlation in, effect of quadrupole coupling on, **7: 3209(J)**

Thorium isotopes Th^{230}

- alpha fine structure intensity, **7: 2690(J)**

Thorium isotopes Th^{232}

- fission with fast neutrons, radiochemical studies, **7: 2151(J)**
- photofission, angular anisotropies of fragments from, **7: 3465(R)**

Thorium isotopes Th^{234}

- beta spectrum, Auger lines in, **7: 3628(J)**

Thorium ores

- (See also **Black sands.**)
- occurrence in Ariz., Nev., and N. Mex., bibliography on, **7: 2805(J)**
- radiometric assay of, equilibrium counter assembly for, **7: 2556**
- reserves in Western Hemisphere, **7: 3442(J)**

Thorium oxide crucibles

- properties and fabrication, **7: 3076**

Thorium oxide-uranium oxide systems

- electric conductivity, **7: 3408(J)**
- magnetic susceptibility of UO_2-ThO_2 solid solutions, **7: 2215(J)**
- phase equilibrium studies, **7: 3087**

Thorium oxide-yttrium oxide systems

- fluorite phase in $ThO_2-Y_2O_3$, structure and electric conductivity of, **7: 2507(J)**

Thorium (IV) oxides

- melting point, **7: 3087**

Thorium powders

- preparation from metallic Th, **7: 3663(P)**

Thorium silicates

- preparation of $ThSiO_4$, **7: 3403(R)**

Thorium sulfides

- heat of formation of Th_2S_3 , **7: 3347**

Thorotrast

- (See **Thorium(IV) oxides.**)

Thulium

- L x-ray emission and absorption spectra, **7: 2934(J)**

Thulium isotopes Tm^{170}

- as gamma source in industry, medicine, and research, **7: 2039(J)**

Thulium sulfates

- absorption spectrum, **7: 2930**

Thymus

- effects of radiation on, **7: 2726(R)**

Thyroid diseases

- diagnosis and therapy with I^{131} , clinical examples, **7: 2221(J)**
- scintigrams in diagnosis and evaluation of I^{131} therapy, **7: 1907(J)**
- therapy of hyperthyroidism with I^{131} , **7: 3297(R)**

Thyroid gland

- effects of chronic doses of I^{131} on, in mice, **7: 2963(J)**
- effects of function of, on fatty acid synthesis, **7: 3343**
- effects of radiation from injected At^{211} on, in rats and monkeys, **7: 2957(R)**
- effects of thiouracil on the collection of I in experimentally induced tumors of, tracer study, **7: 2250(J)**
- effects of x radiation on I uptake by, **7: 1889(J)**
- function of, relationship of growth of thyroid stimulating hormone-secreting pituitary tumors to, **7: 2983(J)**
- iodine (I^{131}) measurement in study of, instrument for, **7: 3538(J)**
- iodine metabolism by neoplastic, **7: 3297(R)**
- iodine uptake by, nutritional factors affecting, **7: 2730(R)**

Thymonucleic acids

- (See **Nucleic acids.**)

Timing circuits

- for neutron time-of-flight measurements, **7: 3143(J)**

Tin

- gamma backscattering, **7: 2896**
- magnetic susceptibility of, **7: 3454(R)**
- neutron production by cosmic rays in, at 0 to 54° latitude and 30,000 ft pressure altitude, **7: 3123(J)**
- pair production cross section at 1.33 and 2.62 Mev, **7: 2130(J)**
- production of cosmic π mesons in, **7: 2833(J)**

Tin-antimony alloys

- superconductivity, magnetic studies of, **7: 3454(R)**

Tin-bismuth alloys

- magnetic properties and superconductivity of, **7: 3454(R)**

Tin fluorides

- preparation and properties, **7: 3380(R)**

Tin isotopes Sn^{113}

- gamma emission and decay schemes, 7: 2197(J)
- K Auger electron intensities of measurement and interpretation, 7: 2186(J)

Tin isotopes Sn^{124}

- double β decay, lifetime of, 7: 3269(J)

Tin-zirconium alloys

- crystal structure and phase studies, 7: 2773(J)

Tissue homogenates

- of spleen, in therapy of radiation injuries, 7: 1873

Tissues

- (See also specific tissues.)
- energy absorption in, due to nuclear reactions produced by high-energy x rays, 7: 1882(J)
- neutron flux distribution in, 7: 2723
- preparation for radiometric analysis when Co^{60} is used as tracer, 7: 3341
- quantitative radiography of, determination of mass of cells by, 7: 2744
- radiography of reference system for, 7: 2743
- radiometric analysis for tracer amounts of P^{32} and Na^{24} , 7: 2248(J)
- separation and assay of choline and dimethylethanolamine in, by ion exchange, 7: 3038

Titanium

- arc welding of, effect of atmospheric contaminants on, 7: 1995(R)
- brazing to Ti or to other metals and alloys, 7: 3091
- chemical analysis, 7: 3009
- corrosion by liquid Pb at 1000°C , 7: 2312(J)
- corrosion by molten salts, electrodeposition, and H overvoltages of, 7: 3092(R)
- corrosion resistance in organic compounds, 7: 3427(J)
- crucibles for, study of refractory materials for use as, 7: 3425
- effects of H on mechanical properties of, 7: 1996
- electroplating under various conditions, 7: 2571(R)
- fabrication, metallurgy, and properties of, 7: 1997(R)
- fatigue properties of, effects of geometry of notch and speed of testing on, 7: 3094
- grain size control in, effect of additions of C, Ni, V, Al, and N on, 7: 3460(R)
- habit plane determination of β in α , 7: 3093
- metallurgy of, bibliography on, 7: 2820
- neutron capture gamma-rays from, 7: 3107(R)
- physical and chemical properties, survey of, 7: 3108
- physical and mechanical properties of, summary and bibliography, 7: 3419
- spectrographic analysis for oxygen, 7: 3361
- surface hardening with metalloid elements, 7: 2565(R)
- welds, effects of C, O, and N on strength and ductility of, 7: 2574(J)

Titanium alcohulates

- physical properties and structural chemistry of, 7: 1919(J)
- reactions with acetyl chlorides, 7: 1921(J)

Titanium alloys

- chemical analysis, 7: 3009
- electroplating under various conditions, 7: 2571(R)
- fabrication, metallurgy, preparation, and properties of, 7: 1997(R)
- fatigue properties of, effects of geometry of notch and speed of testing on, 7: 3094
- grinding of, methods for, 7: 3450
- mechanical properties and thermal expansion, 7: 3418
- physical and mechanical properties of, summary and bibliography, 7: 3419
- recrystallization in, 7: 3460(R)
- welding of, 7: 2005(J)
- welding of β -stabilized, 7: 3447(R)

Titanium-aluminum alloys

- constitution diagrams and mechanical properties, 7: 3458

Titanium-aluminum-chromium alloys

- constitution diagrams and mechanical properties, 7: 3458

Titanium-aluminum-chromium-nickel alloys

- aging characteristics, 7: 2567(R)

Titanium-aluminum-iron alloys

- mechanical properties and phase studies, 7: 3459(R)

Titanium-aluminum-manganese alloys

- mechanical properties and thermal expansion, 7: 3418

Titanium-aluminum-molybdenum alloys

- constitution diagrams and mechanical properties, 7: 3458

Titanium-aluminum-tantalum alloys

- constitution diagrams and mechanical properties, 7: 3458

Titanium-aluminum-vanadium alloys

- mechanical properties and phase studies, 7: 3459(R)

Titanium-boron systems

- constitution diagrams and mechanical properties, 7: 3103

Titanium bromides

- physical and chemical properties, survey of, 7: 3108(R)

Titanium carbides

- physical and chemical properties, survey of, 7: 3108(R)
- pressing in temperature range 3500 to 4600°F , apparatus for, 7: 3089
- thermal conductivity, 7: 3100(R)

Titanium-carbon-chromium systems

- constitution diagrams, 7: 3461

Titanium-carbon-manganese systems

- constitution diagrams, 7: 3461

Titanium-carbon systems

- constitution diagrams and mechanical properties, 7: 3103

Titanium chlorides

- chemical and physical properties, survey of, 7: 3108

Titanium-chromium alloys

- constitution diagrams and mechanical properties, 7: 3458

- welds of, ductility, 7: 3447(R)

Titanium-chromium-iron alloys

- mechanical properties and thermal expansion, 7: 3418

Titanium-chromium-oxygen systems

- phase studies in Ti rich region, 7: 2570

Titanium conferences

- proceedings of, held at Watertown Arsenal, Mass., Oct. 8, 1952, 7: 2563

Titanium-copper alloys

- effects of radiation on electric conductivity and hardness of, 7: 2306

Titanium fluorides

- chemical and physical properties, survey of, 7: 3108

- chemical properties, 7: 3380(R)

Titanium hydrides

- chemical and physical properties, survey of, 7: 3108

Titanium-hydrogen systems

- preparation and properties of, 7: 1996

Titanium iodides

- chemical and physical properties, survey of, 7: 3108

Titanium-iron alloys

- welds of, ductility, 7: 3447(R)

Titanium isotopes Ti^{46}

- nuclear energy levels, 7: 3275(J)

Titanium isotopes Ti^{48}

- energy levels of, from β^- decay of Sc^{48} and β^+ decay of V^{48} , 7: 3277(J)

Titanium isotopes Ti^{51}

- gamma spectra of irradiated, 7: 2454(R)
- half-life, 7: 2391(J)
- half life from Ca^{48} (α, n), Ti^{50} (n, γ), Cr^{54} (n, α), and V^{51} (n, p) reactions, 7: 3266(J)

Titanium-manganese alloys

- martensitic transformation in, mechanism of, 7: 1993

- welds of, ductility, 7: 3447(R)

Titanium-manganese-nitrogen systems

- constitution diagrams, 7: 3461

Titanium-molybdenum alloys

- constitution diagrams and mechanical properties, 7: 3458

- welds of, ductility, 7: 3447(R)

Titanium nitrides

- chemical and physical properties, survey of, 7: 3108

Titanium-nitrogen systems

- constitution diagrams and mechanical properties, 7: 3103

Titanium oxides

- chemical and physical properties, survey of, 7: 3108

Titanium-oxygen systems

- constitution diagrams and mechanical properties, 7: 3103

Titanium-tantalum alloys

- constitution diagrams and mechanical properties, 7: 3458

Titanium-vanadium alloys

- mechanical properties, effect of phase transformations and microstructure on, 7: 2304(R)

Titration equipment

- (See also Laboratory equipment; Remote-control equipment.)

- gating circuit for, 7: 3141(R)

Tolerances

- (See appropriate subheadings under specific radiations, elements, materials, etc.)

Toluene

- diffusion of CS_2 in, under pressure, 7: 2755

Toluylene

- (See Stilbene.)

Toxicology

- (See as subheading under specific materials; see Metabolism.)

Tracer techniques (biology)

- nomenclature, meaning of term "turnover", 7: 2486
- in pharmacological animal experiments, review, 7: 2493(J)

Tracer techniques (botany)

- in study of wilting and death of oak trees, 7: 3340

- Tracer techniques (geology)
 natural C^{14} measurements in age estimations of geological samples, 7: 3429(R)
- Trail Canyon (Idaho)
 uranium distribution, 7: 3441
- Transistors
 use in radiac survey meters, 7: 2363(R)
- Trauma
 cytological effects of surgical, on liver, 7: 1858
 histochemical effects on mouse liver, 7: 1859
 response of liver to partial hepatectomy, in mice, 7: 1860
- Trees
 response of oak to wilt fungi, tracer study, 7: 3340
- Tributyl phosphate
 (See Butyl phosphates.)
- Trichinosis
 effects of radiation on, 7: 2940(R)
- Triphenylmethyl
 hyperfine structure of C^{13} -methyl-labeled, 7: 3199(J)
- Tritium
 (See also Hydrogen.)
 activities of materials labeled with, determination with liquid scintillators, 7: 2373(J)
 beta decay, average charge on He^3 following, 7: 3107(R)
 deuteron reactions (d, α), cross sections for, 7: 2884(J)
 helium (He^3) nucleus reactions, 7: 2009(R), 2873(R)
 metabolic equivalence with deuterium, 7: 1908(J)
 physical and chemical properties, bibliography, 7: 2846
 proton reactions (p, γ), angular distribution correlation with angular momenta coupling, 7: 2140(J)
 proton reactions (p, γ), excitation function for, 7: 3220
 proton reactions (p, γ), γ -ray yield from, 7: 2009(R)
 recovery of, used in Chalk River ion accelerator, 7: 2581(J)
- Tritium ion beams
 nuclear reactions produced by, 7: 3593(J)
- Tritons
 (See also Tritium ion beams.)
 neutron scattering by at 14 Mev, theory, 7: 2905(J)
 production in d-d collisions, 7: 3110
 production in reaction $p + d \rightarrow t + \pi^+$, 7: 2578(R)
- Tropolone complexes
 formation constants of metal, and derivatives, 7: 2788
- Trudeau Foundation, Saranac Lake, N. Y.
 progress reports on Be toxicology, 7: 2747(R)
- Tumors
 (See also specific tumors, organs, tissues, animals, etc.)
 in back of hand, anatomical complications of x-ray therapy of, 7: 2969(J)
 bone, Ga^{67} as tracer in localization of metastases of, 7: 2247(J)
 diagnosis with I^{131} -labeled diiodofluorescein and diiododeuterioporphyrins, 7: 2249(J)
 distinction between malignant and non-malignant melanoblasts, tracer study, 7: 2971(R)
 effects of radiations and cytocides on, 7: 1886(J)
 effects on plasma protein levels, 7: 3297(R)
 induced by beta-particles, 7: 2727(R)
 induced by injected methylcholanthrene and x radiation, 7: 3316(J)
 induction of, coaction of estrogen with 20-methylcholanthrene in, 7: 2727(R)
 lanthanum metabolism by, 7: 2480(R)
 in plants of *Ipomoea tuba* following exposure to radiation from an atomic explosion, 7: 2461
 skin, induced by subcarcinogenic dose of β radiation followed by applications of croton oil, 7: 2950
 therapy of lung, with Ag-coated Au^{198} colloids, effect on lymphatic drainage 7: 3332(J)
 therapy with intracavitary injections of colloidal Au^{198} , pathological effects of, 7: 3334(J)
 therapy with La^{139} and La^{140} , 7: 2480(R)
 thyroid, effect of thiouracil on collection of I by, 7: 2250(J)
 thyroid, iodine metabolism by, 7: 3297(R)
 thyroid stimulating hormone-secreting, of pituitary, relationship of thyroid function to growth of, 7: 2983(J)
- Tungsten
 electron field emission from, crystallographic variation in, 7: 2590(R)
 electron field emission from, with high vacuum, clean surfaces, and high electric fields, 7: 2339(J)
 magnetic structure of, neutron-diffraction measurements, 7: 3131(J)
 radiation damage to, x-ray-diffraction methods for evaluating, 7: 2177(J)
 soldering to metal plates, technique for, 7: 3463(J)
- Tungsten electrodes
 thoriated, health hazards in inert-gas arc welding with, 7: 1895(J)
- Tungsten isotopes W^{182}
 gamma spectra, for energy region above 500 kev, 7: 2921
- Tungsten isotopes W^{187}
 decay schemes, 7: 2929(J)
 half life, 7: 2191(J)
 neutron activation cross sections, 7: 2116
- Turbojet engines
 performance and radiation effects on, 7: 2940(R)
- Turbulent flow
 (See Fluid flow (turbulent).)
- ## U
- Ultrasonic inspection
 (See appropriate subheadings under specific materials.)
- Ultraviolet radiation
 effects on enzymes and viruses, 7: 2270
- Ultraviolet spectroscopy
 bibliography covering period 1938 through 1952, 7: 2426
- Underwater warfare
 equipment and physiological factors concerned with underwater demolition, 7: 2945
- University of Southern Calif.
 progress reports on boron hydrides, 7: 1915(R)
- Uracil
 biosynthesis of tritium-labeled, 7: 3296(R)
- Uracil, 2-thio-
 effects on collection of I in experimentally induced thyroid tumors, tracer study, 7: 2250(J)
- Uraninites
 (See also Pitchblendes.)
 occurrence in Marysville ore, 7: 3077(R)
- Uranium
 alpha reactions, analysis of secondary particles from, 7: 2656
 analysis for μg amounts of Be, 7: 3359
 colorimetric determination, thiocyanate-acetone method for, 7: 1924
 compression and tensile stress of cast and wrought, 7: 2808
 determination, manual of procedures for, 7: 1922
 determination in Ga-U alloys, 7: 3358
 determination in U_3O_8 -polystyrene mixtures, 7: 1923
 diffusion in nuclear emulsions loaded with silk threads impregnated with uranyl acetate, 7: 2367(J)
 electrodeposition of thin uniform adherent films of, method for, 7: 2451(P)
 fission by μ^- and π^- mesons, 7: 3174
 fluorescence in NaF phosphors, quenching action of Fe and Pu on, 7: 3156
 fluorimetric determination using photographic film, 7: 3011(J)
 fluorophotometric determination, 7: 1929(J)
 isothermal transformation of metastable β , 7: 2505
 isotopic analysis, method for, 7: 2451(P)
 neutron total cross sections, 7: 3205(J)
 neutron total cross sections between 3 and 12 Mev, 7: 2123(J)
 neutron total cross sections between 25 kev and 7 Mev, 7: 2115
 occurrence in asphaltites, determination of form of, 7: 3433(R)
 photofission and photon neutron emission in, 7: 2663(J)
 photofission yields at 48 Mev, 7: 2714(J)
 position in periodic system, 7: 3004(J)
 soldering to metal plates, technique for, 7: 3463(J)
 titration in radioactive minerals, use of liquid emulsion in, 7: 1925
- Uranium antimonides
 crystal structure of USb and U_3Sb_4 , 7: 2510(J)
 crystal structure of USb_2 , 7: 2509(J)
- Uranium arsenides
 crystal structure of UAs and U_3As_4 , 7: 2512(J)
 crystal structure of UAs_2 , 7: 2508(J)
- Uranium(IV) borohydrides
 methyl derivatives of, preparation and properties, 7: 2541(J)
 preparation and properties of, 7: 2540(J)
- Uranium(IV) bromides
 preparation by reaction of U nitride with Br, 7: 3660(P)
- Uranium-carbon sandstone deposits (Utah)
 genesis and mineralogy, 7: 3434
- Uranium(IV) chlorides
 production by electrolytic reduction of UO_2Cl_2 in HCl, 7: 3060(J)
- Uranium complexes
 with heterocyclic diketones, preparation, 7: 3665(P)
- Uranium deposits
 in California, Idaho, Mont., Oreg., Wash., and Wyo., bibliography on, 7: 3438

- Uranium deposits (Alaska)
occurrence, 7: 2801
- Uranium deposits (Mont.)
mineralogy of, 7: 3432(R)
- Uranium deposits (Utah)
occurrence, 7: 2555
- Uranium(IV) fluorides
production by UF_6 reaction with HCl, HBr, or HI at elevated temperatures, 7: 3666(P)
reaction with $Al(BH_4)_3$ for preparation of $U(BH_4)_4$, 7: 2540(J)
- Uranium(VI) fluorides
physical properties, 7: 3294(J)
reaction with a hydrogen halide to produce UF_4 , 7: 3666(P)
- Uranium-gallium alloys
analysis of, containing 1 to 99% Ga, 7: 3358
- Uranium(IV) ions
electron configuration for, 7: 2215(J)
- Uranium isotopes U^{233}
pathological effects on kidneys, 7: 2745
preparation of carrier-free, by, 7: 2783(J)
production by induced radioactive chain, reaction kinetics and economic aspects of, 7: 3215(J)
- Uranium isotopes U^{235}
fission neutron spectrum, 7: 2939(J)
fission-product decay schemes, calculations on, 7: 2437
- Uranium isotopes U^{237}
formation from U^{238} (γ, n), yield as function of γ energy, 7: 2663(J)
gamma emission and decay scheme, 7: 2189(J)
- Uranium isotopes U^{238}
bremsstrahlung reactions (γ, n) and (γ , fission), 7: 2663(J)
pathological effects on kidneys, 7: 2745
- Uranium isotopes U^{240}
radiations from, and calculation of binding energy of last neutron for, 7: 3257
- Uranium minerals
(See also specific minerals, e.g., Autunites.)
age estimation by Pb^{210} , 7: 3430
diagnostic associates, 7: 2558
synthesis, 7: 3434
thermal analysis of metamict, 7: 3086(J)
- Uranium molybdates
occurrence in Marysvale ore, 7: 3077(R)
- Uranium nitrides
reaction with Br to prepare UBr_4 , 7: 3660(P)
- Uranium ores
age estimation of Colorado Plateau, by Pb-U methods, 7: 3079
classification of low grade Colorado Plateau, air concentrator for, 7: 3439
detection of, scintillation type γ -ray well logging unit for, 7: 2300
health hazards associated with mining and milling of, 7: 2242(J)
occurrence in Ariz., Nev., and N. Mex., bibliography on, 7: 2805(J)
radiometric assay of, equilibrium counter assembly for, 7: 2556
- Uranium oxide-cerium oxide systems
crystal structure and electric conductivity, 7: 3408(J)
phase studies, 7: 3409(J)
- Uranium oxide-lanthanum oxide systems
phase studies, 7: 2536(J)
- Uranium oxide-neodymium oxide systems
phase studies, 7: 2536(J)
- Uranium oxide-samarium oxide systems
phase studies, 7: 2536(J)
- Uranium oxide-scandium oxide systems
phase studies, 7: 2536(J)
- Uranium oxide-styrene polymer systems
analysis, 7: 1923
- Uranium oxide-thorium oxide systems
electric conductivity, 7: 3408(J)
magnetic susceptibility of UO_2 - ThO_2 solid solutions, 7: 2215(J)
phase equilibrium studies, 7: 3087
- Uranium oxide-ytterbium oxide systems
phase studies, 7: 2536(J)
- Uranium oxides
phase studies, 7: 2537(J)
- Uranium(IV) oxides
high-temperature reactions, 7: 2588
oxidation at low temperatures, 7: 2537(J)
thermal conductivity, 7: 3100(R)
- Uranium(IV-VI) oxides
spectrographic determination in carnotite ores, 7: 2804(J)
- Uranium(VI) oxides
bromination of, to prepare $UOBr_3$ and $UOBr_2$, 7: 2539(J)
- Uranium(IV) oxybromides
preparation by bromination of UO_3 , 7: 2539(J)
- Uranium(V) oxybromides
preparation by bromination of UO_3 , 7: 2539(J)
- Uranium(VI) oxychlorides
(See Uranyl chlorides.)
- Uranium oxysulfides
chemical properties, 7: 2538(J)
- Uranium phosphides
crystal structure of UP_2 , 7: 2508(J)
- Uranium-vanadium sandstone deposits
genesis and occurrence, 7: 3437
occurrence in McKinley and Valencia Counties, N. Mex., 7: 2803
petrographical studies of, 7: 3436(R)
- Uranium-vanadium sandstone deposits (Utah)
genesis and mineralogy, 7: 3434
- Uranyl chlorides
electrolytic reduction to UCl_4 in HCl, 7: 3060(J)
preparation, melting point, and specific conductivity, 7: 1964(J)
- Uranyl complexes
(See Uranium complexes.)
- Uranyl compounds
(See also specific compounds.)
anion analysis of, use of cation exchange resin for, 7: 2500
- Uranyl fluorides
density and refractive index of, as function of concentration, 7: 2790
- Uran District (Colo.)
exploration, 7: 3082(R)
- Uran ores
(See Carnotites.)
- Urine
analysis for fluorine, 7: 1930(J)
chromatographic analysis for corticosterones, 7: 3006
removal of radiiodine from, rapid method for, 7: 1910(J)
- Utah
exploration, 7: 3434
geophysical exploration, 7: 3431
uranium distribution, 7: 3441
- Utah (Emery Co.)
geophysical exploration by subsurface isorad methods, 7: 3078
uranium deposits in, 7: 2558
- Utah (Kane Co.)
uranium deposits in, 7: 2555
- Utah (Sevier Co.)
prospecting for U, 7: 3077(R)
- Uterus
phosphorus metabolism by, effects of hormones on, 7: 2252(J)

V

V particles

(See also S particles.)

- decay, use of BF_3 neutron counters to obtain cloud-chamber photographs of, 7: 3168(J)
- decay of a charged 2500-me particle, 7: 2867(J)
- decay schemes, examination by general invariance principles and charge-independence hypothesis, 7: 3655(J)
- heavy charged, decay schemes, 7: 3178(J)
- lifetime of charged, 7: 3490(J)
- neutral, production in 450-Mev proton-bombarded targets, 7: 3542(J)
- neutral, production in low-energy nuclear interactions, 7: 3487(J)
- properties, 7: 2108(J)

Vacuum furnaces

- design and operation, 7: 2517

Vacuum gages

- Bayard-Alpert ionization, control circuit for, 7: 2590(R)
- shunted thermocouple type, design, 7: 1979(J)

Vacuum pumps

(See also Diffusion pumps; Jet pumps.)

- design of, to prevent backstreaming, 7: 2319
- solvent evaporator for, 7: 2293(J)

Vacuum seals

(See also Seals and glands.)

- demountable design of, 7: 1977(J)
- rotary, design of, 7: 2294(J)

Vacuum systems

- controlled gas leak for, 7: 2845(J)
- flexible vacuum joint for, 7: 1976(J)
- key for analyzing failures in, 7: 2577

Vacuum systems (Cont'd)

- particle-initiated high-vacuum sparks, 7: 3495
- sparkling as function of electrode surface gradient, 7: 2826

Vacuum valves

- (Including stopcocks; see also Valves.)
- design, 7: 1978(J)

Valine

- radiation decomposition of C^{14} -labeled during storage, 7: 3030
- synthesis of C^{14} -labeled, 7: 3404

Valve packing

- (See Seals and glands.)

Valves

- (See also Vacuum valves.)
- for cloud chambers, design, 7: 2625(J)
- flow control, for handling corrosive gases at low velocity, 7: 2442(P)
- magnetically operated flow switch for use in presence of strong magnetic fields, 7: 2441(P)
- thermal control, for low flow coefficient, 7: 3141(R)

Van de Graaff accelerators

- operation and performance of, 7: 2638(R)
- telemetering system for, design, 7: 2667(J)

Vanadium

- colorimetric determination in biological materials with 8-quinolinol, 7: 3364(J)
- corrosion by liquid Pb at 1000°C, 7: 2312(J)
- magnetic structure of, neutron-diffraction measurements, 7: 3131(J)
- neutron capture gamma rays from, 7: 3107(R)

Vanadium-aluminum-titanium alloys

- mechanical properties and phase studies, 7: 3459(R)

Vanadium isotopes V^{48}

- decay schemes, 7: 3277(J)

Vanadium isotopes V^{49}

- energy levels from decay of Cr^{53} , 7: 3261

Vanadium isotopes V^{51}

- deuteron reactions (d,p), angular distribution of protons from, 7: 2659(J)

Vanadium isotopes V^{52}

- half-life, 7: 2391(J)

Vanadium-oxygen systems

- structure, lattice parameters, and temperature-composition existence of, 7: 2823(J)

Vanadium-titanium alloys

- mechanical properties, effect of phase transformations and microstructure on, 7: 2304(R)

Vanadium-uranium sandstone deposits

- genesis and occurrence, 7: 3437
- petrographical studies of, 7: 3436(R)

Vanadium-uranium sandstone deposits (Utah)

- genesis and mineralogy, 7: 3434

Vapor pressure

- (See also as subheading under specific materials.)
- compilation of data for elements from Br to U and their oxides and carbides, 7: 2758

Vein deposits

- genesis and occurrence of, throughout the world, 7: 3445(J)

Vein deposits (Mont.)

- mineralogy of, 7: 3432(R)

Versene

- (See Acetic acid, (ethylenediamine)tetra-, sodium salt.)

Versene acid

- (See Acetic acid, (ethylenediamine)tetra-.)

Viability

- (See as subheading under specific plants and animals.)

Virial theorem

- for Thomas-Fermi and Thomas-Fermi-Dirac systems when $T=0$, 7: 3508(J)

Viruses

- effects of radiation on, in blood plasma, 7: 2940(R)
- effects of ultraviolet radiation on, 7: 2270

Viscometers

- for anomalous flow studies in sealed systems, design, 7: 3500

Vision

- (See also Eyes.)
- radiation as tool in study of, 7: 3304

Vitamin B₁₂

- growth-promoting activity of, reversal of inhibition of, 7: 2716

Vitro Corp. of America

- progress reports on laboratory waste disposal unit, 7: 3410(R), 3411(R)

Voltmeters

- high-frequency shunt for, 7: 3670(P)

W

Wanakah Formation

- geobotanical prospecting and mineralogy of, 7: 2803

Washington

- uranium and Th occurrences in, 7: 3438

Washington Univ., Seattle

- progress reports on atmospheric turbulence, 7: 3183(R)

Wasps

- effects of x radiation and ingested P^{32} on life span of, 7: 2467(J)

Waste disposal

- For treatment of radioactive wastes prior to disposal see Waste processing; see also Sewage.)
- permanent methods for, economic evaluation of, 7: 2798
- problems of, general discussion and recommendations, 7: 1965
- release from sewage system to river, 7: 2317(R)
- survey of methods used for, by radioisotope users, 7: 3410(R)

Waste disposal conferences

- papers presented at South District Filtration Plant, Chicago, Sept. 1952, 7: 2799

Waste processing

- incineration, evaluation of conventional refuse-type incinerators for, 7: 3061(R)
- incineration of waste containing P^{32} , hazards of, 7: 1909(J)
- by ion exchange, laboratory unit for, 7: 3411(R)
- ion-exchange column for, 7: 2317(R)
- problems of, general discussion and recommendations, 7: 1965
- removal of fission products from water, a comparison of treatment methods, 7: 3327(R)
- treatment of radioactive laundry waste on trickling filters, 7: 1966(R)

Water

- (See also Ice; Radioactive waters; Sea water.)
- decontamination, papers presented at South District Filtration Plant, Chicago, Sept. 1952, 7: 2799
- exchange of O isotopes between HNO_3 and, 7: 1960(J)
- isotope product removal from, a comparison of methods, 7: 3327(R)
- flowing in round and rectangular channels, two-phase pressure drop and burnout data for, 7: 1971
- ground state of, self-consistent field calculation of, 7: 3548
- isotopic exchange reactions with O_2 , catalysis of, 7: 2529(J)
- isotopic fractionation, equipment for, 7: 2528(J)
- mass-spectrographic analysis for D_2O , 7: 2048(J)
- molecular structure, 7: 3550(R)
- molecular structure of, wave functions for, 7: 2429(R)
- neutron scattering by, 7: 2167(J)
- oxidation by $Ce(IV)$ in $HClO_4$ solution, 7: 3033
- preparation of high-purity, design of still for, 7: 3028
- purification by lime softening, 7: 1914
- radioactive contamination in, techniques for assaying, 7: 3325
- self-diffusion, effect of pressure on, 7: 2989

Water-d

- microwave spectra, 7: 2590(R)

Water-d₂

- infrared spectra of, adsorbed on silica gel, 7: 3019(J)
- isotopic analysis, 7: 2526(J)
- mass-spectrographic determination in H_2O , 7: 2048(J)
- microwave absorption spectra, 7: 2774(J)
- miscibility with picolines and lutidines, 7: 1932(J)
- neutron scattering by, 7: 2167(J)
- production by electrolysis, 7: 1935(J)
- as solvent in infrared spectroscopy, 7: 3018(J)
- thermal conductivity, 7: 2792(R)
- thermodiffusion in H_2O - D_2O mixtures, 7: 2043(J)
- toxicology of, bibliography on, 7: 2746
- viscosity of gaseous, 7: 3551(J)

Water boiler neutron source

- design and operation, 7: 3214

Water-carbon dioxide systems

- chemical reactions induced in, by electric discharge, 7: 2837
- Water-cobalt chloride-2-propanol, 2 methyl- systems phase studies, 7: 2993

Water vapor

- microwave spectra, 7: 3499(R)
- reaction with Ca metal, in temperature range 177 to 344°C, 7: 3349

Watertown Arsenal Lab.

- progress reports on electroplating on Ti, 7: 2571(R)

Waveguides

- (See subheadings concerning transmission under Microwaves.)

Wave mechanics

(See Quantum mechanics and appropriate subheadings under Radiation.)

Wavellites

analysis and genesis of, 7: 3081

Welding

cone-arc process, evaluation for miniature tube-to-header type heat exchangers, 7: 3102

Welds

leaks in, method for testing for, 7: 3669(P)

Well logging

gamma and neutron, detecting systems for, 7: 3537(J)

portable-apparatus for, design, 7: 2617(J)

scintillation-type γ unit for U ore, 7: 2300

Wheatstone bridge

theory, 7: 3392(R)

White Canyon Area (Utah)

exploration, 7: 3434

Wires

reduction in size of Ir and Ir-Rh alloy, by electrolysis, 7: 1991

Wood

gamma backscattering, 7: 2896

Wyoming

uranium and Th occurrences in, 7: 3438

uranium distribution, 7: 3441

X

X radiation

(See also Gamma radiation; Photons.)absorption anomalies of M_{IV} edge in heavy elements, 7: 3639(J)

cytological effects on liver, in mice, 7: 1867

detection and measurement, direct reading ion current instrument for, 7: 2058

diffuse scattering of, 7: 2672

dosage determinations during rotational therapy, instrument for, 7: 2244(J)

dosage determinations for head and neck, 7: 2972

effects of cabbages and carrots in diet on sensitivity to, 7: 1888(J)

effects of irradiation of exteriorized spleen with, on red-blood-cell count in mice, 7: 2473(J)

effects of lethal total-body, on phosphate distribution, glycogen and sulfhydryl content, Na-K distribution, water content and cytochrome oxidase activity in liver and kidneys, of rats, 7: 1868

effects of O on changes in chromosomes induced by, in *Drosophila*, 7: 1883(J)

effects of single exposures to, on man, 7: 2734(J)

effects of therapeutic doses on growing spine, 7: 2228(J)

effects of whole-body, combined with burns from thermal radiation, on mice, 7: 2724

effects of whole-body, on glycogen utilization by liver, 7: 1893(J)

effects on antibody formation in rabbits, 7: 2955

effects on antibody formation in rats, 7: 3320(J)

effects on C metabolism in mice, 7: 2235(J)

effects on chromosomes of *Tradescantia*, 7: 1890(J)

effects on circulating blood cells of tadpoles, 7: 1872

effects on cytochrome C, 7: 1875(J)

effects on developing nervous system, 7: 3302

effects on development of bacteriophage in bacteria, 7: 3315(J)

effects on growth and metabolism of rat bone, 7: 2227

effects on lactase formation by *E. coli*, 7: 3321(J)

effects on life span of wasps, 7: 2467(J)

effects on *M. audouini*, 7: 2964(J)effects on metabolism of adenosine triphosphate in *E. coli*, 7: 2967(J)

effects on metabolism of fats, 7: 3307(J)

effects on micronuclear number in *P. aurelia*, 7: 2472(J)

effects on physicochemical properties of albumins and globulin, 7: 1876(J)

effects on pituitary gland and secondary effects on sexual system, of rats, 7: 2231(J)

effects on respiratory system of *E. coli*, 7: 2965(J)

effects on self-diffusion coefficient of Na in NaCl, 7: 2920(J)

effects on serum Na and K levels, 7: 2733

effects on skin of rabbits, 7: 1891(J)

effects on susceptibility of mice to injected *S. enteritidis* and *E. coli*, 7: 3301

effects on susceptibility to septicemia, 7: 3305

effects on urinary excretion of desoxyribonuclease, in rats, 7: 2966(J)

fluorescent, analysis with proportional detectors, 7: 2851

half-value thicknesses for Cu and Al, 7: 2898

induction of abnormal lymphocytes in rabbits by, 7: 1869

induction of cataracts by, 7: 3308(J)

X radiation (Cont'd)

induction of ring chromosome in maize by, 7: 3311(J)

inhibition of mitosis by, combined with naphthalenediol derivatives, 7: 2222(J)

intracavernous applicators for, 7: 3336(J)

lethal-dosages for mice, compared with lethal thermal-neutron dosages, 7: 1870

lethal effects on yeast, 7: 2465(J)

from μ -meson capture in Bohr orbits, 7: 2864

nuclear photodisintegrations, review, 7: 2154(J)

nuclear reactions produced in human tissues by, effects on energy absorption, 7: 1882(J)

observable angular correlation between internal conversion electrons and, 7: 2880

pathological effects on kidneys, 7: 2468(J)

pathological effects on ovaries, 7: 2466(J)

pathological effects on rat embryos at various ages in gestation, 7: 3322

pathological effects on rat embryos on ninth day of gestation, 7: 2463(J)

pathological effects on weanling and adult rats, 7: 2959

penetrating power of 31-Mev, measurement of, 7: 3163(J)

physical and radiographic properties of, in 2- to 6-Mev range, 7: 2322(R)

radioactivity induced in yeast by 100-Mev, 7: 2464(J)

radiosensitivity of barley seed to, 7: 2735(J)

thermoluminescence in CaF_2 colored by, 7: 2420(J)

tissue depth-dose distribution of 31-Mev, 7: 2973(J)

transmission through breasts, axilla, and excised tissue, rate of, 7: 3333(J)

X-ray beams

filtration of, at various kv levels, 7: 3327(R)

X-ray-diffraction analysis

(See also as subheading under specific materials.)

application of Geiger counters in, review, 7: 2376(J)

using low angles and long wavelengths, design of unit for, 7: 3111(J)

X-ray emission

(See as subheading under specific materials.)

X-ray spectra

of rare earths, multiplicity in, 7: 3050(J)

theory and measurement of, 7: 2319

X-ray spectrometers

for analysis of elements 11 through 26, design, 7: 2933(R)

design and performance of, 7: 2319

X-ray spectroscopy conferences

on applications to solid state problems, papers presented at Wisconsin Univ., Oct. 23-25, 1950, 7: 2319

Xanthine, 2-aminohypo-

(See Guanine.)

Xenon

ionization probability curves for, 7: 2047(J)

Xenon isotopes Xe^{128}

nuclear energy levels, 7: 2923(J)

Xenon isotopes Xe^{129}

energy levels, 7: 3278(J)

Xenon isotopes Xe^{133}

as gamma source in industry, medicine, and research, 7: 2039(J)

Xenon isotopes Xe^{135}

beta decay, average charge of daughter following, 7: 3107(R)

Y

Yeasts

lethal effects of radiation on cells of, mathematical theory of, 7: 2225

lethal effects of x radiation on, 7: 2465(J)

metabolism of methionine by *Torulopsis utilis*, tracer study, 7: 2978

radioactivity induced in, by 100-Mev x rays, 7: 2464(J)

Yield point

(See appropriate subheadings under specific materials.)

Ytterbium

preparation by distillation from La, 7: 3034

Ytterbium oxide-uranium oxide systems

phase studies, 7: 2536(J)

Yttrium

deposition in rabbit bones, 7: 3346(J)

electric conductivity, 7: 2318(R)

electrochromatographic separation of, 7: 1955(J)

ion-exchange separation, 7: 2784(J)

Yttrium isotopes Y^{87}

beta decay of, selection rules for, 7: 3621(J)

Yttrium isotopes Y^{90}

radiocolloidal properties and preparation of carrier-free, 7: 3058(J)

Yttrium isotopes Y^{91}

decay schemes, 7: 3265(J)

Yttrium isotopes Y^{91}

decay schemes, 7: 2654

Yttrium isotopes Y^{92} mass assignment of, from yield in $Zr^{84}(d,\alpha)Y^{92}$ reaction, 7: 2139Yttrium isotopes Y^{94} mass assignment of, from yield in $Zr^{86}(d,\alpha)Y^{94}$, 7: 2139

Yttrium oxide-thorium oxide systems

fluorite phase in $ThO_2-Y_2O_3$, 7: 2507(J)

Z

ZEEP

(Canadian zero energy exponential pile.)

relaxation times, comparison of experimental and theoretical data on, 7: 2398(J)

Zinc

gravimetric determination and separation of, evaluation of procedures using radioisotopes, 7: 3366(J)

neutron capture gamma rays from, 7: 3107(R)

toxic effects of excessive dietary, on liver enzymes in rats, 7: 2975

Zinc-aluminum alloys

clustering in, measurement of, 7: 2671

diffuse x-ray scattering of, interpretation from powder patterns, 7: 2670

effects of Cu additions on plastic properties of, 7: 2564

magnetic susceptibility of, 7: 3454(R)

Zinc-aluminum-copper alloys

plastic properties, 7: 2564

Zinc-aluminum-magnesium alloys

effects of cold work on microstructure and corrosion resistance, 7: 2001(J)

Zinc chelates

crystal structure of zinc 8-hydroxyquinolate dihydrate, 7: 2585

Zinc chlorides

hydration in nonaqueous solvents, 7: 1912

Zinc complexes

with thiocyanate, formation of, 7: 2255

with tropolone, chemical stability, 7: 2788

Zinc crystals

cleavage, mechanism of, 7: 1987

plastic deformation, mechanism, 7: 2018

plastic deformation and recovery upon annealing, 7: 3130

Zinc isotopes Zn^{62}

half life, 7: 2887(J), 3593(J)

Zinc isotopes Zn^{64} deuteron reactions ($d,\alpha n$) and (d,α), relative cross sections from β -decay data, 7: 3595(J)Zinc isotopes Zn^{65}

gamma and positron spectra and conversion coefficients, 7: 2927(J)

preparation of carrier-free, by paper chromatography, 7: 2783(J)

Zinc isotopes Zn^{67}

metastable states, 7: 3593(J)

nuclear energy levels, 7: 2684, 3273(J)

nuclear magnetic moments, 7: 2649(J)

Zinc isotopes Zn^{69}

separation of isomeric recoil atoms by ion exchange, 7: 1949(J)

Zinc sulfides

effects of α irradiation on fluorescence of, 7: 3615(J)

effects of neutron irradiation on phosphors of, 7: 2683(J)

electronic transitions in luminescence of, 7: 3164(J)

Zeolites

(See specific compounds; see Cation exchanging materials.)

Zirconium

abundance ratio to Hf in ores, 7: 3443(J)

analysis for Al by ion exchange, 7: 3367(J)

analysis for oxygen by HCl volatilization, 7: 2525

anodic oxide films on, inhibition of gas-phase reactions by, 7: 2995

behavior of hydrogen in, 7: 2807

bibliography on, 7: 2819, 3098(R)

chemical properties and analysis for oxygen, 7: 2560

corrosion embrittlement in HCl, 7: 3428(J)

corrosion resistance in organic compounds, 7: 3427(J)

ductile welding of, 7: 2007(J)

electrochemical polarization in NaCl solutions, 7: 1918

melting point, 7: 3458(R)

neutron scattering cross sections, 7: 3107(R)

neutron total cross sections, in 3- to 12-Mev region, 7: 2123(J)

physical properties, bibliography on, 7: 1994

production by electrolysis of fused salts, 7: 3098(R)

reclamation of machining chips to produce arc-melting feed stock, 7: 1986

soldering to metal plates, technique for, 7: 3463(J)

Zirconium (Cont'd)

spectrographic analysis for Hf, 7: 1928(J)

tensile properties, 7: 3458(R)

Zirconium alcohols

physical properties and structural chemistry, 7: 1919(J)

reactions of chlorides of, with alcohols, 7: 1920(J)

reactions with acetyl chlorides, 7: 1921(J)

Zirconium alloys

corrosion embrittlement in HCl, 7: 3428(J)

fabrication, corrosion, and mechanical properties of, 7: 2569

plating on other metals by chemical methods, 7: 2560

production, 7: 2560

tensile properties, 7: 2818(R)

Zirconium-aluminum alloys

tensile properties of, up to 300°C, 7: 3457(R)

Zirconium carbides

ball milling, 7: 1980(J)

Zirconium(IV) chloride complexes

zirconium chloride alkoxides, reactions with alcohols, 7: 1920(J)

Zirconium(IV) chloride-sodium chloride systems

fusion, 7: 2560

Zirconium chlorides

reactions with alcohols, 7: 1920(J)

Zirconium(IV) chlorides

production from K_2ZrF_6 and ZrSi and reaction with metals, 7: 2560

Zirconium coatings

electrodeposition from a fused bath, 7: 2560

Zirconium compounds

bibliography on hydrides, oxides, halides, nitride, carbide, and alkaline earth zirconates, 7: 1994

electrolysis of, for production of Zr, 7: 3098(R)

Zirconium(IV) fluorides

production from reaction of Zr oxychloride and HF, 7: 3661(P)

thermal decomposition, 7: 3380(R)

Zirconium-hafnium alloys

lattice parameters, 7: 2315(J)

Zirconium-hydrogen systems

diffusion, ductility, and phase studies of, 7: 2807

Zirconium isotopes Zr^{87} gamma reactions (γ,n), cross sections for, 7: 2403(J)Zirconium isotopes Zr^{89}

beta decay of isomeric, selection rule for, 7: 3621(J)

decay scheme, 7: 2403(J)

Zirconium isotopes Zr^{90} gamma reactions (γ,n), cross sections for, 7: 2403(J)Zirconium isotopes Zr^{92} mass difference of Mo^{92} and, 7: 2045(J)Zirconium isotopes Zr^{94} mass difference of Mo^{94} and, 7: 2045(J)Zirconium isotopes Zr^{95}

decay schemes, 7: 2190(J)

gamma emission, 7: 2638(R), 2853

Zirconium isotopes Zr^{96} double β decay, lifetime of, 7: 3269(J)mass difference of Mo^{96} and, 7: 2045(J)

Zirconium-lead alloys

crystal structure and phase studies, 7: 2773(J)

Zirconium-molybdenum alloys

tensile properties of, up to 300°C, 7: 3457(R)

Zirconium-niobium alloys

corrosion embrittlement in HCl, 7: 3428(J)

tensile properties of, up to 300°C, 7: 3457(R)

Zirconium oxide crucibles

properties and fabrication, 7: 3076

Zirconium oxide films

formation of anodic, inhibition of gas-phase reactions of Zr by, 7: 2995

Zirconium oxides

ball milling, 7: 1980(J)

compression strength of porous sintered, 7: 1981(J)

monoclinic to tetragonal phase transformation in, 7: 3372

Zirconium oxyfluorides

(See Zirconyl fluorides.)

Zirconium powders

production by chemical methods and fusion electrolysis, 7: 2560

Zirconium silicate crucibles

properties and fabrication, 7: 3076

Zirconium silicates

preparation of $ZrSiO_4$, 7: 3403(R)

Zirconium-tantalum alloys

corrosion embrittlement in HCl, 7: 3428(J)

tensile properties of, up to 300°C, 7: 3457(R)

Zirconium-tin alloyscrystal structure and phase studies, **7: 2773(J)****Zircons**hafnium/Zr abundance ratio and specific radioactivities of, **7: 3443(J)**reaction with S and K_2SiF_6 , **7: 2560****Zircon-carbon systems**chlorination, **7: 2560****Zirconyl fluorides**reaction with HF to prepare ZrF_4 , **7: 3661(P)**

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REPORT	ABSTRACT	AVAILABILITY	REPORT	ABSTRACT	AVAILABILITY
MDDC	ADD		AECD	ADD	
217	1,p.118	Blood 2, 40-9(1947)	2016	2,p.343	J. Lab. Clin. Med. 33, 1077-81(1948)
971	1,p.573	J. Ind. Hyg. Toxicol. 30, 370-2(1948)	2017	2,p.343	Proc. Soc. Exptl. Biol. Med. 71, 658-60 (1949)
1219	1,p.676	Science 107, 16-17(1948)	2018	2,p.344	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24
1224	1,p.685	J. Heredity 39, 29-31(1948)	2019	2,p.344	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24
1226	1,p.685	J. Biol. Phot. Assoc. 16, 65-77(1947)	2023	2,p.346	Am. J. Med. Sci. 217, 379-82(1949) NNES Div. VI, Vol. 1, Pt. III, Chap. 21
1570	2,p.42	Blood, 3, 729-54(1948)			
1731	2,p.169	NNES Div. VI, Vol. 1, Pt. III, Chap. 20			
AECD				NSA	
1780	2,p.228	NNES Div. VI, Vol. 1, Pt. III, Chap. 21	2028	1-41	NNES Div. VI, Vol. 1, Pt. III, Chap. 21
1789	2,p.231	Phys. Rev. 76, 704-5(1949)	2092	1-44	Science 108, 538-9(1953)
1801	2,p.236	NNES Div. VI, Vol. 1, Pt. III, Chap. 18	2095	1-41F	J. Lab. Clin. Med. 34, 158-77(1949)
1915	2,p.285	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24	2127	1-611	NNES Div. VI, Vol. 1, Pt. III, Chap. 22
1916	2,p.286	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24	2129	1-612	NNES Div. VI, Vol. 1, Pt. III, Chap. 21
1917	2,p.286	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24	2150	1-749	NNES Div. VI, Vol. 1, Pt. IV, Chap. 23; J. Pharmacol. Exptl. Therap. 96, 179-87, 198-208(1949)
1918	2,p.287	NNES Div. VI, Vol. 1, Pt. III, Chap. 21	2161	1-753	NNES Div. VI, Vol. 1, Pt. III, Chap. 19
1919	2,p.287	NNES Div. VI, Vol. 1, Pt. III, Chap. 21	2204	1-906	J. Pharmacol. Exptl. Therap. 96, 95-8 (1949)
1920	2,p.287	NNES Div. VI, Vol. 1, Pt. IV, Chap. 23	2212	1-907	NNES Div. VI, Vol. 1, Pt. IV, Chap. 23
1924	2,p.290	Am. J. Med. Sci. 216, 619-24(1948)	2215	1-908	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24
1925	2,p.290	Am. J. Med. Sci. 216, 643-55(1948)	2216	1-1074	NNES Div. VI, Vol. 1, Pt. III, Chap. 18
1963	2,p.307	NNES Div. VI, Vol. 1, Pt. III, Chap. 21; J. Ind. Hyg. and Toxicol. 30, 319-31(1948)	2244	1-223	NNES Div. VI, Vol. 1, Pt. III, Chap. 21
1964	2,p.307	NNES Div. VI, Vol. 1, Pt. IV, Chap. 25	2267	1-1226	NNES Div. VI, Vol. 1, Pt. III, Chap. 19
1966	2,p.309	Arch. Surg. 60, 635-67(1950)	2442	2-898	NNES Div. VI, Vol. 1, Pt. III, Chap. 21
1967	2,p.310	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24	2504	2-1437	Phys. Rev. 75, 1107-8(1949)
1968	2,p.311	NNES Div. VI, Vol. 1, Pt. IV, Chap. 25	2580	2-2080	NNES Div. VI, Vol. 1, Pt. IV, Chap. 18
1981	2,p.316	NNES Div. VI, Vol. 1, Pt. IV, Chap. 25			
2008	2,p.335	NNES Div. VI, Vol. 1, Pt. III, Chap. 21			

REPORT	ABSTRACT	AVAILABILITY	REPORT	ABSTRACT	AVAILABILITY
AECD	NSA		AECU	NSA	
2720	3-2287	p.1267-82 in Mechanical Engineers Handbook, 5th Ed. L. S. Marks, ed. N. Y., McGraw Hill, 1951	146	2-1329	Anal. Chem. 22, 837-8(1950)
2769	4-1906	NNES Div. VI, Vol. 1, Pt. III, Chap. 18	148	2-1337	NNES Div. VI, Vol. 1, Pt. III, Chap. 19
2770	4-1908	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	149	2-1434	J. Clin. Invest. 28, 746-51(1949)
2771	4-1909	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	422	3-1623	Science 111, 117-18(1950)
2772	4-1910	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	667	4-1907	NNES Div. VI, Vol. 1, Pt. III, Chap. 19
2773	4-1911	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	668	4-1919	NNES Div. VI, Vol. 1, Pt. III, Chap. 21
2774	4-1912	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	669	4-1920	NNES Div. VI, Vol. 1, Pt. III, Chap. 21
2775	4-1913	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	670	4-1352	NNES Div. VI, Vol. 1, Pt. III, Chap. 21
2776	4-1914	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	673	4-1615	Science 111, 655-7(1950)
2777	4-1915	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	744	4-3627	Federation Proc. 9, 338(1950)
2778	4-1916	NNES Div. VI, Vol. 1, Pt. III, Chap. 20	746	4-3635	Federation Proc. 9, 206(1950)
2779	4-1917	NNES Div. VI, Vol. 1, Pt. III, Chap. 21	748	4-3581	Federation Proc. 9, 334-5(1950)
2780	4-1918	NNES Div. VI, Vol. 1, Pt. III, Chap. 21	1077	5-1440	p.49-51 in Americana Annual, John J. Smith, ed. N. Y., Americana Corp., 1952
2783	4-1924	NNES Div. VI, Vol. 1, Pt. IV, Chap. 25	1314	5-4189	Anais acad. brasil. cienc. 24, 113-36(1952)
2784	4-1925	NNES Div. VI, Vol. 1, Pt. IV, Chap. 26	1565	5-5344	J. Applied Phys. 23, 1085-8(1952)
2785	4-1926	NNES Div. VI, Vol. 1, Pt. IV, Chap. 26	1681	6-6578	Cancer Research 13, 27-9(1953)
2786	4-1927	NNES Div. VI, Vol. 1, Pt. IV, Chap. 26	1713	6-6	Quart. Rev. Biol. 26, 348-63(1951)
2787	4-1928	NNES Div. VI, Vol. 1, Pt. IV, Chap. 27	1855	6-1799	Rev. Sci. Instr. 24, 267-8(1953)
2788	4-1929	NNES Div. VI, Vol. 1, Pt. IV, Chap. 28	1977	6-3610	Rev. Sci. Instr. 24, 1-4(1953)
2789	4-1930	NNES Div. VI, Vol. 1, Pt. IV, Chap. 29	1988	6-3329	Rev. Sci. Instr. 24, 72-3(1953)
2905	4-5843	Am. J. Physiol. 163, 733-4(1950)	1991	6-3154	Radiology 60, 421-4(1953)
3080	5-3083	Acta Cryst. 6, 269-72(1953)	1996	6-3630	Rev. Sci. Instr. 24, 148-51(1953)
3227	5-5873	Am. J. Phys. 21, 151-9(1953)	1999	6-3711	Phys. Rev. 89, 919-22(1953)
3269	6-353	Am. J. Phys. 20, 536-58(1952)	2017	6-3761	J. Chem. Phys. 20, 1688-94(1952)
3323	6-2082	J. Metals (N.Y.) 5, 545-8(1953)	2021	6-3769	J. Phys. Chem. 57, 129-34(1953)
3343	6-2619	Anal. Chem. 25, 226-30(1953)	2026	6-3744	J. Phys. Chem. 56, 877-81(1952)
3344	6-2874	Anal. Chem. 25, 466-70(1953)	2041	6-3911	Arch. Ind. Hyg. and Occupational Med. 6, 512-17(1952)
3349	6-3280	J. Am. Ceram. Soc. 36, 137-9(1953)	2061	6-4113	Ind. Eng. Chem. 45, 1148-52(1953)
3352	6-3445	\$0.25	2079	6-4437	Biochim. et Biophys. Acta 9, 597-600(1952)
3363	6-3259	J. Chem. Phys. 21, 542-4(1953)	2085	6-4341	J. Immunol. 70, 135-40(1953)
3389	6-4520	J. Applied Phys. 24, 44-8(1953)	2089	6-4551	J. Chem. Phys. 20, 1670-2(1952)
3419	6-5238	Rev. Sci. Instr. 24, 181(1953)	2092	6-4552	J. Chem. Phys. 20, 1665-9(1952)
3421	6-5374	J. Applied Phys. 24, 152-6(1953)	2101	6-4685	Science 117, 280-2(1953)
3433	6-5764	J. Am. Chem. Soc. 75, 798-800(1953)	2103	6-4730	Anal. Chem. 25, 350-1(1953)
3436	6-5863	Phys. Rev. 90, 102(1953)	2106	6-4849	Rev. Sci. Instr. 24, 79-80(1953)
3438	6-5735	Anal. Chem. 25, 644-5(1953)	2114	6-4711	J. Invest. Dermatol. 20, 93-103(1953)
3453	7-219	J. Soc. Motion Picture Television Engrs. 59, 503-11(1952)	2138	6-5037	J. Biol. Chem. 200, 407-16(1953)
3455	7-438	Phys. Rev. 89, 320(1953)	2142	6-5416	Rev. Sci. Instr. 24, 75-6(1953) (Condensed version)
3456	7-147	\$0.35	2145	6-5284	Am. J. Botany 39, 679-84(1952)
3466	7-706	J. Opt. Soc. Amer. 43, 216(1953)	2151	6-5282	Laboratory Invest. 2, 1-14(1953)
3474	7-690	Phys. Rev. 90, 6-10(1953)	2167	6-5533	Arch. Biochem. and Biophys. 42, 72-82(1953)
3484	7-1272	\$0.20	2168	6-5570	Anal. Chem. 24, 2000(1952)
3486	7-1666	\$0.55	2170	6-5546	Evolution 6, 333-41(1952)
3488(Rev)	7-1854	\$0.25	2171	6-5580	J. Am. Chem. Soc. 75, 461-6(1953)
3494	7-2049	0.20	2178	6-5578	Rev. Sci. Instr. 24, 298-303(1953)
3502	7-2356	0.35	2179	6-5534	Stain Technol. 28, 19-26(1953)
AECU			2181	6-5591	Rev. Sci. Instr. 24, 16-19(1953)
67	2-916	Rev. Sci. Instr. 20, 324(1949)	2183	6-5557	J. Nutrition 49, 183-90(1953)
77	2-1022	Arch. Biochem. 23, 131-6(1949)	2184	6-5558	Botan. Gaz. 114, 180-9(1952)
86	2-1150	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24	2186	6-5560	J. Am. Chem. Soc. 75, 832-5(1953)
132	2-1455	NNES Div. VI, Vol. 1, Pt. IV, Chap. 24	2189	6-5535	Arch. Biochem. and Biophys. 42, 25-40(1953)
			2196	6-5694	Ann. Rev. Nuclear Sci. 2, 187-220(1952)
			2199	6-5576	Phys. Rev. 89, 870-5(1953)
			2207	6-5634	Rev. Sci. Instr. 24, 10-12(1953)
			2208	6-5926	Cancer Research 12, 912-14(1952)
			2214	6-5927	Cancer Research 12, 915-17(1952)
			2218	6-5965	J. Econ. Entomol. 45, 988-97(1953)
			2220	6-5980	J. Biol. Chem. 200, 515-23(1953)
				6-6102	J. Chem. Phys. 21, 274-8(1953)

REPORT	ABSTRACT	AVAILABILITY	REPORT	ABSTRACT	AVAILABILITY
AECU	NSA		AECU	NSA	
2228	6-6292	<u>J. Biol. Chem.</u> 200, 155-9(1953)	2479	7-2757	<u>J. Chem. Phys.</u> 21, 589-97(1953)
2223	6-6338	<u>J. Am. Chem. Soc.</u> 75, 552-5(1953)	2487	7-2941	<u>J. Am. Chem. Soc.</u> 75, 1741-2(1953)
2227	6-6339	<u>J. Biol. Chem.</u> 200, 605-7(1953)	2499	7-3219	<u>Phys. Rev.</u> 90, 460-3(1953)
2231	6-6407	<u>Nucleonics</u> 11, No. 1, 70(1953)	2500	7-3198	<u>Phys. Rev.</u> 90, 464-8(1953)
2239(add.)	7-1449	<u>Phys. Rev.</u> 89, 654(1953)	2501	7-2979	<u>J. Biol. Chem.</u> 200, 661-8(1953)
2248	6-6238	<u>Bull. Johns Hopkins Hosp.</u> 92, 79-97(1953)			
2249	6-6239	<u>Cancer Research</u> 13, 21-6(1953)	AERE C/M		
2253	6-6527	<u>J. Am. Chem. Soc.</u> 74, 6152 (1952)	127	6-2587	1s.0d.
2254	6-6647	<u>J. Applied Phys.</u> 24, 434-8(1953)	129	6-2770	1s.0d.
2255	6-6654	<u>J. Chem. Phys.</u> 21, 371-2(1953)	131	6-2872	1s.3d.
2257	6-6709	<u>Phys. Rev.</u> 89, 672-8(1953)	132	6-3522	1s.3d.
2260	6-6692	<u>Non-Destructive Testing</u> 11, No. 3, 30-3 (1953)	152	7-100	2s.6d.
2261	6-6551	<u>J. Am. Chem. Soc.</u> 75, 739-41(1953)	154	7-520	1s.0d.
2264	6-6494	<u>Am. J. Roentgenol. Radium Therapy Nuclear Med.</u> 69, 272-93(1953)			
2269	6-6617	<u>Science</u> 117, 343-9(1953)	AERE C/R		
2272	6-6661	<u>Non-Destructive Testing</u> 11, No. 2, 28-32 (1952)	552	5-2221	1s.9d.
2278	7-5	<u>Arch. Pathol.</u> 55, 20-30(1953)	801	6-2860	7s.0d.
2284	7-385	<u>Phys. Rev.</u> 89, 854-5(1953)	813	6-3771	4s.6d.
2286	7-505	<u>Arch. Biochem. and Biophys.</u> 42, 257-70 (1953)	861	6-5114	7s.6d.
2290	7-527	<u>Rev. Sci. Instr.</u> 24, 328-9(1953)	959	6-6510	12s.6d.
2291	7-658	<u>Phys. Rev.</u> 89, 760-5(1953)	988	7-3156	6s.6d.
2293	7-466	<u>Tech. Bull. Registry Med. Technols.</u> 23, 65-72(1953)	1004	7-2008	3s.0d.
2296	7-669	<u>Phys. Rev.</u> 89, 824-6(1953)	1061	7-1407	4s.0d.
2302	7-659	<u>Phys. Rev.</u> 89, 1251-4(1953)		7-2864	<u>Phil. Mag.</u> (7) 44, 208-11(1953)
2312	7-612	<u>J. Chem. Phys.</u> 20, 1981-2(1952)	AERE EL/R		
2323	7-778	<u>J. Am. Chem. Soc.</u> 75, 1110-15(1953)	750	7-1472	3s.0d.
2332	7-1348	\$0.20	805	6-2709	3s.0d.
2334	7-1364	<u>Proc. Soc. Exptl. Biol. Med.</u> 82, 248-52 (1953)	AERE E/R		
2335	7-1317	<u>J. Histochem. and Cytochem.</u> 1, 123-37 (1953)	817	6-2654	2s.6d.
2345	7-1365	<u>J. Am. Chem. Soc.</u> 75, 1680-4(1953)	AERE G/M		
2346	7-1829	NSA	96	6-2367	<u>J. Sci. Instr.</u> 29, 336-7(1952)
2354	7-1779	<u>Phys. Rev.</u> 90, 420-8(1953)	144	7-3136	1s.3d.
2355	7-1327	<u>Refriger. Eng.</u> 61, 55-7, 104(1953)	AERE G/R		
2358	7-1879	<u>Phys. Rev.</u> 90, 393-400(1953)	462	4-2712	1s.6d.
2361	7-1574	<u>Proc. Soc. Exptl. Biol. Med.</u> 82, 137-40 (1953)	477	4-6126	2s.0d.
2365	7-1780	<u>Phys. Rev.</u> 89, 665(1953)	478	4-4883	4s.0d.
2366	7-1623	<u>J. Chem. Phys.</u> 21, 381-2(1953)	480	4-3477	1s.6d.
2367	7-1830	<u>J. Chem. Phys.</u> 21, 372-3(1953)	784	6-1185	2s.6d.
2369	7-1580	<u>Nucleonics</u> 11, No. 3, 29-31(1953)	1020	7-1464	3s.6d.
2377	7-1581	<u>Proc. Soc. Exptl. Biol. Med.</u> 82, 208-12 (1953)	1039	7-2028	1s.6d.
2384	7-1789	<u>Phys. Rev.</u> 89, 1302-3(1953)	AERE I/M		
2387	7-1577	<u>Proc. Soc. Exptl. Biol. Med.</u> 81, 125-8(1952)	16	6-2890	1s.9d.
2390	7-1867	<u>J. Natl. Cancer Inst.</u> 13, 123-38(1953)	18	7-517	1s.0d.
2392	7-2139	<u>Phys. Rev.</u> 89, 1156-7(1953)	AERE Inf. Bib.		
2394	7-2116	NSA; <u>Phys. Rev.</u> 89, 1306(1953)	76	6-1529	5s.0d.
2398	7-2270	Published in four installments as follows: <u>Arch. Biochem. and Biophys.</u> 31, 72-6 (1951); <u>Biochim. et Biophys. Acta</u> 9, 240-6(1952); <u>Biochim. et Biophys. Acta</u> 9, 597-600 (1952); and <u>J. Polymer Sci.</u> 10, 333-44(1953)	80	6-1423	1s.0d.
			83	7-212	1s.3d.
2421	7-2486	NSA	AERE I/R		
2426	7-2245	<u>Arch. Ind. Hyg. Occupational Med.</u> 7, 148-148-51(1953)	1038	7-3146	2s.6d.
2437	6-3069	<u>Science</u> 115, 284-5(1952)	AERE M/R		
2440	7-2894	<u>Phys. Rev.</u> 89, 1165-70(1953)	427	5-119	<u>J. Inst. Metals</u> 77, 553-69(1950)
2441	7-2875	<u>Phys. Rev.</u> 89, 1271-2(1953)	AERE N/R		
2451	7-2716	NSA	370	3-1971	2s.6d.
2462	7-2878	<u>Phys. Rev.</u> 90, 321-2(1953)	987	6-6870	<u>Phil. Mag.</u> (7) 44, 77-84(1953)
2464	7-2987	<u>J. Chem. Phys.</u> 21, 575-88(1953)	AERE R/L		
2465	7-2988	<u>J. Chem. Phys.</u> 21, 597-601(1953)	■	7-666	5s.0d.

REPORT	ABSTRACT	AVAILABILITY	REPORT	ABSTRACT	AVAILABILITY
AERE R/R			BNL		
922	7-667	Nucleonics 11, No. 2, 50-60 (1952); 6s.Od.	1305	7-1498	Phys. Rev. 89, 1081-9(1953)
961	7-1506	2s.Od.	1307	7-1374	J. Am. Chem. Soc. 75, 1795-7(1953)
1019	7-1473	1s.9d.	1322	7-1500	Physica 18, 1091-3(1952)
1035	7-1507	1s.3d.	1327	7-1526	Phys. Rev. 90, 430-9(1953)
AERE T/M			1329	7-1596	Arch. Ind. Hyg. Occupational Med. 7, 109-10(1953)
68	7-1517	2s.Od.	1330	7-1718	\$0.20
AERE T/R			1333	7-1790	Phys. Rev. 89, 880-1(1953)
334	4-2758	8s.Od.	1337	7-1736	Phys. Rev. 89, 1148(1953)
437	4-1523	1s.6d.	1338	7-2119	NSA; Phys. Rev. 89, 1146(1953)
443	4-1324	1s.9d.	1341	7-2198	Nucleonics 11, No. 3, 18-20(1953)
451	4-2045	1s.6d.	CEA		
467	4-2421	2s.6d.	149	7-1724	J. phys. radium 13, 670-1(1952)
802	6-1003	2s.6d.	CRP		
1006	7-1463	2s.6d.	527	7-2382	Can. J. Phys. 31, 267-77(1953)
1008	7-1494	2s.6d.	HW		
1062	7-2723	1s.6d.	25210	6-6121	Nucleonics 11, No. 4, 28-31(1953)
1072	7-3229	1s.6d.	25258	7-235	\$0.10
AMRL			26763	7-1831	\$0.20
74	6-3181	Science 117, 155-6(1953)	ISC		
ANL			216	6-3546	J. Phys. Chem. 57, 215-19(1953)
4808	6-4037	J. Chem. Phys. 21, 419-23(1953)	231	6-4394	J. Am. Chem. Soc. 75, 1388-92(1952)
4816	6-4132	Rev. Sci. Instr. 24, 148-51(1953)	260	6-5991	Anal. Chem. 25, 249-52(1953)
ARL-RI/R			263	6-5738	Anal. Chem. 25, 416-19(1953)
251	5-2510	J. Sci. Instr. 29, 189-92(1952)	264	6-6014	J. Org. Chem. 18, 267-75(1953)
BMI			269	7-77	Anal. Chem. 25, 407-11(1953)
758	6-5377	\$0.10	282	7-419	Revs. Modern Phys. 25, 129-30(1953)
773	7-1111	0.10	K		
BNL			751	5-3903	Anal. Chem. 25, 619-24(1953)
97	5-4647	Biol. Progress 2, 1-52(1952)	939	6-6000	J. Chem. Phys. 21, 602-8(1953)
196	7-1857	\$0.95	940	7-532	J. Chem. Phys. 21, 609-14(1953)
216	7-2118	\$0.10	980	7-782	J. Am. Chem. Soc. 75, 1211-14(1953)
1010	6-546	J. Bacteriol. 63, 661-4(1952)	KAPL		
1016	5-6999	Arch. Biochem. and Biophys. 34, 478-9 (1951)	385	5-867	J. Applied Phys. 23, 1085-8(1952)
1055	6-1373	Heating and Ventilating 49, 95(1952)	LA		
1058	6-1792	Anal. Chem. 24, 1356-7(1952)	1475	7-617	\$0.35
1117	6-2357	Electrical Const. and Maint. 51, 58-9(1952)	LADC		
1137	6-2804	Agron. J. 44, 610-14(1952)	1183	7-2637	Rev. Sci. Instr. 24, 91-6(1953)
1138	6-3203	Am. J. Physiol. 172, 93-9(1953)	M		
1146	6-3148	Arch. Biochem. and Biophys. 43, 33-8 (1953)	1980	1-906	NNES Div. VI, Vol. 1, Pt. IV, Chap. 25
1188	6-5009	Am. Naturalist. 87, 29-48(1953)	4795	7-1866	Proc. Natl. Acad. Sci. U.S. 38, 706-15 (1952)
1198	6-5263	Am. Naturalist 86, 391-8(1952)	MIT		
1203	6-5427	Rev. Sci. Instr. 24, 141-8(1953)	1103	7-1434	\$0.20
1205	6-5300	J. Am. Chem. Soc. 75, 28-30(1953)	MTA		
1212	6-5355	J. Am. Chem. Soc. 75, 30-3(1953)	10	7-2544	\$0.20
1224	6-5987	J. Biol. Chem. 200, 565-9(1953)	23	7-2855	\$0.10
1227	6-5935	J. Bacteriol. 65, 305-9(1953)	NAA-SR		
1231	6-6149	Physica 18, 1034-6(1952)	178	6-3572	Rev. Sci. Instr. 24, 80-1(1953)
1233	6-6119	NSA; Rev. Sci. Instr. 23, 769(1952)	NBS		
1234	6-6120	Rev. Sci. Instr. 23, 765(1952)	1762	6-6036	Rev. Sci. Instr. 24, 326-7(1953)
1235	6-5988	J. Biol. Chem. 200, 525-8(1953)	1955	7-348	Phys. Rev. 90, 146-50(1953)
1240	6-6388	Revs. Modern Phys. 25, 114-21(1953)	2308	7-2767	\$0.20
1245	6-5983	J. Am. Chem. Soc. 75, 1827-30(1953)	NSA		
1247	6-6091	Science 117, 1-3(1953)	NSA		
1256	6-6530	J. Am. Chem. Soc. 75, 728-30(1953)	NSA		
1262	6-6707	J. Am. Chem. Soc. 75, 1256-7(1953)	NSA		
1272	7-473	Proc. Soc. Exptl. Biol. Med. 81, 836-8(1952)	NSA		
1277	7-1808	Nucleonics 11, No. 3, 49-51(1953)	NSA		
1280	7-599	Phys. Rev. 89, 826-31(1953)	NSA		
1288	7-691	Physica 18, 1110-11(1952)	NSA		
1290	7-2399	NSA	NSA		
1300	7-999	Phys. Rev. 89, 1267-70(1953)	NSA		
1304	7-1181	\$0.25	NSA		

REPORT	ABSTRACT	AVAILABILITY	REPORT	ABSTRACT	AVAILABILITY
NM	NSA		UCLA	NSA	
006-012.04.54	7-493	<u>Am. J. Physiol.</u> <u>170</u> , 418-25 (1952)	181	6-1617	<u>J. Am. Pharm. Assoc., Sci. Ed.</u> <u>41</u> , 614-17 (1952)
NP			200	6-3890	<u>J. Bacteriol.</u> <u>85</u> , 151-6(1953)
3583	6-2104	<u>Phys. Rev.</u> <u>90</u> , 115-19(1953)	203	6-4682	<u>Cancer Research</u> <u>12</u> , 818-22(1952)
3596	6-2117	<u>Acta Cryst.</u> <u>5</u> , 811-17(1952)	205	6-4344	<u>Cancer Research</u> <u>12</u> , 823-8(1952)
3830	6-4015	<u>J. Am. Chem. Soc.</u> <u>75</u> , 1560-2(1953)	207	6-5277	<u>Science</u> <u>117</u> , 139-40(1953)
4000	6-5568	<u>J. Am. Chem. Soc.</u> <u>75</u> , 1830-2(1953)	209	6-5418	<u>Rev. Sci. Instr.</u> <u>24</u> , 269-71(1953)
4043	6-6554	<u>J. Am. Chem. Soc.</u> <u>75</u> , 1232-36(1953)	210	6-5419	<u>Electronics</u> <u>26</u> , 124-5(1953)
4188	6-2480	<u>Phys. Rev.</u> <u>85</u> , 532-9(1952)	211	6-5509	<u>J. Opt. Soc. Amer.</u> <u>43</u> , 42-3(1953)
4202	7-1286	<u>J. Chem. Phys.</u> <u>20</u> , 1979(1953)	213	6-5253	<u>Am. J. Physiol.</u> <u>172</u> , 195-202(1953)
4215	7-1610	<u>J. Phys. Chem.</u> <u>57</u> , 385-90(1953)	214	6-5254	<u>Am. J. Physiol.</u> <u>172</u> , 203-10(1953)
4223	7-812	<u>Vide, Le 7</u> , 1262-6(1952) (In French)	216	6-5552	<u>Ann. Allergy</u> <u>11</u> , 1-11(1953)
4267	7-1652	<u>J. Am. Chem. Soc.</u> <u>75</u> , 860-3(1953)	217	6-5540	<u>Proc. Soc. Exptl. Biol. Med.</u> <u>81</u> , 298-300 (1952)
4352	6-6095	<u>J. Applied Phys.</u> <u>23</u> , 1028-32(1952)	220	6-5887	<u>Rev. Sci. Instr.</u> <u>24</u> , 73-4(1953)
NYO			222	6-5971	<u>Arch. Biochem. and Biophys.</u> <u>43</u> , 118-26 (1953)
729	6-1631	<u>J. Am. Chem. Soc.</u> <u>75</u> , 451-5(1953)	224	7-40	<u>Proc. Soc. Exptl. Biol. Med.</u> <u>81</u> , 665-7 (1952)
769	6-6363	<u>J. Applied Phys.</u> <u>24</u> , 52(1953)	231	7-101	<u>Am. Ind. Hyg. Assoc. Quart.</u> <u>14</u> , 26-30 (1953)
793	6-1400	<u>Anal. Chem.</u> <u>25</u> , 482-6(1953)	237	7-714	\$0.20
1642	6-3743	<u>Radiology</u> <u>59</u> , 849-57(1952)	244	7-2719	<u>J. Am. Pharm. Assoc. Sci. Ed.</u> <u>41</u> , 614-17 (1953)
3001	6-2740	<u>Phys. Rev.</u> <u>85</u> , 489-90(1952)	UCRL		
3006	6-1801	<u>Rev. Sci. Instr.</u> <u>24</u> , 193-5(1953)	1198	5-3647	\$0.25
3067	6-5315	<u>Anal. Chem.</u> <u>25</u> , 127-30(1953)	1390	7-496	<u>J. Aviation Med.</u> <u>23</u> , 345-72(1952)
3201	7-2897	<u>Phys. Rev.</u> <u>90</u> , 160-1(1953)	1505	6-93	<u>J. Am. Chem. Soc.</u> <u>74</u> , 3431(1952)
3225	6-6134	<u>Phys. Rev.</u> <u>89</u> , 766-74(1953)	1549	6-38	<u>Am. J. Physiol.</u> <u>172</u> , 579-87(1953)
3262	7-2181	<u>Phys. Rev.</u> <u>89</u> , 664(1953)	1621(rev)	6-5464	<u>Phys. Rev.</u> <u>87</u> , 425-33(1952)
3367	6-1633	<u>J. Am. Chem. Soc.</u> <u>75</u> , 455-7(1953)	1687	6-3261	<u>J. Am. Chem. Soc.</u> <u>75</u> , 474-9(1953)
3368	6-1634	<u>J. Am. Chem. Soc.</u> <u>75</u> , 457-60(1953)	1720	6-3260	<u>Ann. Rev. Phys. Chem.</u> <u>3</u> , 215-28(1952)
3581	6-4411	<u>J. Electrochem. Soc.</u> <u>100</u> , 131-5(1953)	1795	6-4083	<u>Elec. Eng.</u> <u>72</u> , 212-18(1953)
3631	7-2761	<u>J. Am. Chem. Soc.</u> <u>75</u> , 1735-6(1953)	1863	7-1631	\$0.25
3661	6-6440	<u>Phys. Rev.</u> <u>90</u> , 83-6(1953)	1875	6-5864	<u>J. Am. Chem. Soc.</u> <u>74</u> , 4216(1952)
3814	7-2671	<u>J. Applied Phys.</u> <u>24</u> , 365(1953)	1876	6-6435	<u>Phys. Rev.</u> <u>90</u> , 183-5(1953)
3871	7-711	<u>J. Am. Chem. Soc.</u> <u>75</u> , 466-70(1953)	1899	6-5856	<u>Phys. Rev.</u> <u>90</u> , 224-32(1953)
3901(p.15-36)	7-390	<u>Phys. Rev.</u> <u>89</u> , 679-83(1953)	1913(rev.)	7-350	<u>Phys. Rev.</u> <u>89</u> , 603-5(1953)
4026	6-6524	<u>New Engl. J. Med.</u> <u>247</u> , 877-80 (1952)	1918	6-6330	<u>J. Am. Chem. Soc.</u> <u>75</u> , 796-7(1953)
4435	6-6576	\$0.80	1937	6-6696	<u>Phys. Rev.</u> <u>89</u> , 1019-22(1953)
4436	6-6542	0.45	1939	6-6671	<u>Phys. Rev.</u> <u>90</u> , 469-72(1953)
4503	7-2300	<u>Nucleonics</u> <u>11</u> , No. 4, 34-9(1953)	1950	7-510	\$0.35
4506	7-1966	\$0.20	1955	7-41	<u>Nucleonics</u> <u>11</u> , No. 3, 56, 58(1953)
ORNL			1956	7-58	<u>J. Am. Chem. Soc.</u> <u>75</u> , 1962-7(1953)
1044	6-192	<u>Instruments</u> <u>25</u> , 1096-1101(1952)	1960	7-351	<u>Phys. Rev.</u> <u>89</u> , 790-2(1953)
1342	7-1695	\$0.20	1991	7-681	<u>Phys. Rev.</u> <u>89</u> , 758-9(1953)
1347	6-6689	\$0.20	1996	7-978	\$0.55
1405	7-626	\$0.20	2004	7-1095	\$0.20
1414	7-2425	0.25	2005	7-937	<u>Phys. Rev.</u> <u>89</u> , 878-9(1953)
1461	7-2307	\$0.20	2008	7-1402	\$0.25
1470	7-2030	0.20	2013	7-1486	\$0.55
1499	7-2880	\$0.10	2019	7-1834	<u>Phys. Rev.</u> <u>90</u> , 267-70(1953)
ORO			2031	7-1816	<u>Phys. Rev.</u> <u>89</u> , 879-80(1953)
81	7-113	<u>J. Chem. Phys.</u> <u>21</u> , 383-93(1953)	2037	7-1519	\$0.20
RCC/R			2041	7-2533	\$0.20
26	7-245	4s.0d.	2060	7-1835	\$0.55
BEU			2062	7-1763	0.35
87	7-1443	\$0.25	2075	7-2613	0.10
120	7-2308	\$0.45	2079	7-1839	\$0.10
BO			2108	7-2828	0.20
3501	7-539	\$0.55	UR		
UCLA			78	3-1623	<u>Science</u> <u>111</u> , 117-8(1950)
128	5-3849	<u>Am. J. Roentgenol. Radium Therapy</u>	132	5-1249	<u>J. Am. Chem. Soc.</u> <u>73</u> , 1212-15(1951)
134	5-4105	<u>Nuclear Med.</u> <u>68</u> , 950-3(1952)	142(p.29-40)	5-2369	<u>Am. J. Physiol.</u> <u>163</u> , 715(1950); <u>J. Pharmacol. Exptl. Therap.</u> <u>101</u> , 14(1951)
		<u>Rev. Sci. Instr.</u> <u>24</u> , 78-9(1953)	176	5-4308	<u>J. Biol. Chem.</u> <u>193</u> , 243-51(1953)
			185	6-2560	<u>Biochim et Biophys. Acta</u> <u>8</u> , 369-74(1952)
			187	5-6953	<u>Proc. Soc. Exptl. Biol. Med.</u> <u>78</u> , 687-9 (1951)
			213(p.56)	6-5541	<u>Federation Proc.</u> <u>11</u> , 133(1952)
			213(p.57)	6-5541	<u>Federation Proc.</u> <u>11</u> , 183(1952)

REPORT	ABSTRACT	AVAILABILITY	REPORT	ABSTRACT	AVAILABILITY
UR	NSA		UR	NSA	
213(p.58)	6-5541	<u>Federation Proc. 11, 278(1952)</u>	213(p.67)	6-5541	<u>Federation Proc. 11, 416(1952)</u>
213(p.59)	6-5541	<u>Federation Proc. 11, 280(1952)</u>	213(p.68)	6-5541	<u>Federation Proc. 11, 278(1952)</u>
213(p.60)	6-5541	<u>Federation Proc. 11, 260(1952)</u>	213(p.69)	6-5541	<u>Federation Proc. 11, 162(1952)</u>
213(p.61)	6-5541	<u>Federation Proc. 11, 182(1952)</u>	215	6-5543	<u>J. Biol. Chem. 200, 759-63(1953)</u>
213(p.62)	6-5541	<u>Federation Proc. 11, 299(1952)</u>	233	7-2463	<u>Am. J. Anat. 92, 153-87(1953)</u>
213(p.63)	6-5541	<u>Federation Proc. 11, 4(1952)</u>			
213(p.64)	6-5541	<u>Federation Proc. 11, 114(1952)</u>	USNRDL		
213(p.65)	6-5541	<u>Federation Proc. 11, 423(1952)</u>	34U	6-3490	<u>J. Aviation Med. 24, 57-62(1953)</u>
213(p.66)	6-5541	<u>Federation Proc. 11, 359(1952)</u>			

NEW NUCLEAR DATA

Summary of New Nuclear Data on Half Lives, Radiations, Relative Isotopic Abundances, Nuclear Moments, Neutron Cross Sections, Reaction Energies, and Masses.

Prepared by National Bureau of Standards Nuclear Data Group with assistance of Readers.

National Bureau of Standards Group: K. Way, C. L. McGinnis, M. Wood, and K. Thew.

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The material cumulated here is that which has appeared in NSA Vol. 7, Nos. 7 through 12A.

ABBREVIATIONS

a	absorption measurement	E	average energy
$a\beta\gamma$	absorption of β 's in coincidence with γ 's	E_0	resonance energy
ace^-	absorption of conversion electrons	E_β, E_γ, \dots	energy of β ray, energy of γ ray, ...
a coin	measurement by placing absorbers between counters in coincidence	E_{dis}	disintegration energy
α	total γ -ray conversion coefficient, N_e/N_γ	EA	electrostatic analyzer
$\alpha_K, \alpha_L, \dots$	γ -ray conversion coefficient for electrons ejected from the K, L, ... shell	$E1, E2, \dots$	electric dipole, electric quadrupole
b	coefficient in angular correlation function, $1 + b \cos^2 \theta$	ϵ	electron capture
B	band spectra method	ϵ_K, ϵ_L	electron capture from K, L shell
$Be\gamma n$	measurement by detection of photoneutrons from Be	f	fission, in abbreviations for methods of production or detection
$\beta\gamma, \gamma\gamma$	$\beta\gamma$ or $\gamma\gamma$ coincidences	F-K	Fermi-Kurie β energy distribution plot
$\beta\gamma(\theta)$	angular correlation of β 's and γ 's in coincidence	$\gamma(\theta, T)$	numbers of γ 's as function of angle and temperature
Calc	calculated value from experimental work reported elsewhere	Γ	resonance half-width (the whole width at half-maximum)
cc	cloud chamber	g.s.	ground state
ce^-	conversion electrons	I	(1) spin in units of $\hbar/2\pi$; (2) nuclear induction magnetic resonance method
chem	chemical separation of product following reaction	ic	ionization chamber
Cpt	Compton electrons	J	quantum state of compound nucleus in a nuclear reaction. "I" is used to denote the spin of the target nucleus, final nucleus
d	(1) deuteron, (2) descendant of, (3) days, when used as superscript	K/L	α_K/α_L
d,p(θ)	angular distribution of protons with respect to deuteron beam	l	angular momentum of particle absorbed into nucleus
D $\gamma n, D\gamma p$	measurement by detection of photoneutrons or photoprotons from deuterium	M	molecular or atomic beam resonance method
		M1, M2, ...	magnetic dipole, magnetic quadrupole...

mb	millibarns	st	strong
Mic	microwave method	$s\pi$	180° spectrometer
mir	measurement by total reflection of neutron beam from mirror surface	$s\pi\sqrt{2}$	double focusing spectrometer
ms	mass spectrometer	σ	cross section in barns
μ	(1) magnetic moment in units of nuclear magnetons, (2) micron, 10^{-4} cm	σ_0	cross section at resonance energy, E_0
μs	microseconds	σ_a	absorption cross section
osc	pile oscillator method	σ_{el}	elastic scattering cross section
p	(1) proton, (2) predecessor of	σ_{in}	inelastic scattering cross section
para	paramagnetic resonance method	σ_s	scattering cross section
pc	proportional counter	σ_t	total cross section
pe ⁻	photo electrons	t	triton, H ³
ppl	photoplates or emulsions	τ	half life in units indicated
q	electric quadrupole moment in units of barns	τ_1, τ_2	half life of upper, lower state
Q	reaction energy in Mev	th	thermal
s	(1) spectrometer method, (2) seconds, when used as superscript	w, vw	weak, very weak
S	atomic-spectra measurement	(0.123)	β and γ energy values enclosed in parentheses are given for identification purposes
scin	scintillation counter	%	% of disintegrations
sl	lens spectrometer	†	relative numbers. When used in connection with γ rays, relative numbers of photons, not photons plus conversion electrons, are meant
sl;ce ⁻	conversion electrons measured in lens spectrometer	+,-	even, odd parity

Standard journal abbreviations are used.

All energies are given in Mev and all cross sections in barns unless otherwise stated in the tabular material.

MAGNETIC MOMENT STANDARDS

In order to have a consistent basis for recording data on magnetic moments, results have been based on the following values and are without diamagnetic corrections.

$$\mu(H^1) = 2.7934 \text{ nuclear magnetons}$$

This value has been adopted arbitrarily because it is the one used as a base in the Table of H. L. Poss, The Properties of Atomic Nuclei, I. Spins, Magnetic Moments and Electric Quadrupole Moments, (Revised, BNL-26 (T-10), (unclassified).) The values reported in the New Nuclear Data summaries are thus directly comparable with those listed in the survey of Poss.

$$\nu(Na^{23})/\nu(H^1) = 0.26450 \text{ E. Bl  uler, M. Gabriel, } \underline{\text{Helv. Phys. Acta } 20, 67(1947)}.$$

$$\nu(D)/\nu(H^1) = 0.153506 \text{ F. Bloch, E. C. Levinthal, M. E. Pachard, } \underline{\text{Phys. Rev. } 72, 1125(1947)}.$$

$$\nu(B^{11})/\nu(H^1) = 0.320827 \text{ D. A. Anderson, } \underline{\text{Phys. Rev. } 76, 434(1949)}.$$

NEW NUCLEAR DATA

${}^4_2\text{He}$
 ${}^3_2\text{H}^3(p, \gamma)$ $E_p = 1 \text{ to } 5.2$
 No resonance for production of $\sim 20\text{-Mev}$ γ 's
 γ yield curve flattens at $\sim E_p = 3.5$
 H.B. Willard, J.K. Bair, J.D. Kington, ORNL-1415,
 3(1952).

${}^3_2\text{H}^3(d, p)$ $E_d = 10.2$ ppl
 No level below 20.9 Mev ($d\sigma/d\Omega$ for excited
 state < 0.2 mb/sterad. at 90° lab.)
 J.C. Allred, Phys. Rev. 84, 695(1951).

${}^4_2\text{He}^4(p, p')$ $E_p = 32$ pc
 No level below 23.3 Mev ($d\sigma/d\Omega$ for low
 energy p group < 0.1 mb/sterad. at 45° c.m.)
 J. Benveniste, B. Cork, Phys. Rev. 89, 422(1953).

${}^5_2\text{He}$
 ${}^3_2\text{H}^3(\text{He}^3, p)$ $E_{\text{He}^3} = 0.30$ scin
 g.s. group observed at $E_p = 9.05$
 No other p group found
 W.M. Good, W.E. Kunz, C.D. Moak, ORNL-1415(1952).

${}^6_3\text{Li}$
 ${}^3_3\text{Li}^6(\gamma, d)\text{He}^4$
 $\sigma < \sim 6 \times 10^{-6}$ for $E_\gamma = 2.76, \sim 7, 17.6$
 Isotopic spin forbidden*
 *A. Bamba, V. Wataghin, Nuovo Cim. 10, 174(1953).
 E.W. Titterton, T.A. Brinkley, Proc. Phys. Soc.
 65A, 1052(1952).

${}^7_3\text{Li}$
 ${}^4_3\text{Li}^6(d, p)$ $\text{Be}^9(d, \alpha)$ s
 0.477
 E.R. Collins, C.D. McKenzie, C.A. Ramm, Proc. Roy.
 Soc. 216A, 242(1953).

Levels $\text{Be}^9(d, \alpha)$ s

Level	$E_d = 0.47$	$E_d = 1.0$
g.s.	100^+	100^+
(0.48)	100^+	70^+
4.62	20^+	100^+

${}^3_2\text{H}^3$ continuum observed from 4.62 level
 \dagger Relative yields at 90°
 R.W. Gelinas, S.S. Hanna, Phys. Rev. 89, 483(1953).

Levels $\text{B}^{10}(n, \alpha)$ $E_n = \text{th}$ pc
 5.8^+ g.s.
 94.2^+ (0.48)
 \dagger Relative cross sections
 U.H. Hauser, Z. Naturf. 7a, 781(1952).

Level $\text{Li}^6(d, p\gamma)$ $E_d = 0.41$
 $p\gamma(\theta)$ (0.478) $I = 1/2$
 A.J. Salmon, E.K. Inall, Proc. Phys. Soc. 66A,
 297(1953).

${}^7_3\text{Li}$
 ${}^4_3\text{Li}^6(n, t)\text{He}^4$ $E_n = 0.27$ ppl
 $n, t(\theta)$ (7.4) $J = 5/2$
 W.O. Solano, J.M. Roberts, Phys. Rev. 89, 892A
 (1953).

Levels $\text{Li}^7(\gamma, \alpha)\text{H}^3$ $E_\gamma = 6.13$ ppl
 $\gamma, \alpha(\theta)$ suggests $3/2^+$, $1/2^-$ interference
 $\sigma = 2.7 \times 10^{-5}$
 H. Nabholz, P. Stoll, M. Wäffler, Helv. Phys. Acta
 25, 701(1952).

Resonances $\text{Li}^7(\gamma, t)\text{He}^4$ $E_\gamma \leq 24$ ppl
 9.3 $21.5?$
 $16.7?$ $23.5?$
 No structure resolved for $\text{Li}^7(\gamma, p)\text{He}^6$
 E.W. Titterton, T.A. Brinkley, Proc. Phys. Soc. 66A,
 194(1953).

${}^8_3\text{Li}$
 ${}^5_3\text{Li}^8\tau$ 0.87^s $\text{Li}(0.6\text{-Mev } d)$
 P. Bretonneau, Compt. rend. 236, 913(1953).

I $3?$ $\text{Li}^7(d, p)$ scin
 $(12.5\beta)(1.5\alpha)(\theta)$ consistent with
 $I = 3, 2, 0$ and not $I = 0, 2, 0$
 C.W. Class, S.S. Hanna, Phys. Rev. 89, 877(1953).

${}^9_3\text{Li}$
 ${}^6_3\text{Li}^9\beta^-$ and 2α 's found in μ meson star
 $E_{\beta^-} \sim 8$, $E_\alpha(\text{total}) = 4.4$ indicate decay of
 Li^9 via 6.8 level of Be^9
 W.F. Fry, Phys. Rev. 89, 325(1953).

${}^7_4\text{Be}$
 ${}^4_4\text{Be}^7$ No reaction observed for $\text{He}(\alpha, n)$
 $\sigma < 7 \times 10^{-4}$ for $E_\alpha = 39$ (threshold = 38)
 Consistent with odd parity for g.s.
 D. Walker, W.T. Link, W.I.B. Smith, Proc. Phys.
 Soc. 65A, 861(1952).

${}^8_4\text{Be}$
 ${}^4_4\text{Be}^8$ Level $\text{Be}^9(d, t)$ ppl
 $g.s.$
 $d, t(\theta)$ for $E_d = 0.295, 0.40, 0.45, 0.52, 0.62$
 D. deJong, P.M. Endt, L.J.G. Simons, Physica 18,
 676(1952).

Levels $\text{B}^{10}(d, \alpha)$ $E_d = 0.59, 0.78, 1.07^*$
 $g.s.$ $1c$
 2.9 $I = 2^*$
 *From fit of theoretical curve to α energy
 spectrum
 Only two α peaks at $E_\alpha \sim 12, \sim 9$
 P.B. Treacy, Phil. Mag. 44, 325(1953).

${}^8_4\text{Be}$ Levels ${}^9\text{Be}(d,t)$ $E_d = 1.0$ s
 3.5^+ g.s.
 15^+ (2.9)
 $^+$ Relative yields at 90°

R.W.Gellinas, S.S.Hanna, Phys. Rev. 89, 483(1953).

Levels ${}^{16}\text{He}^3, p$ $E_{He^3} = 0.72$ scin
 g.s.
 3.2

Only two peaks at $E_p = 14.6, 12.0$

W.M.Good, W.E.Kunz, C.D.Moak, ORNL-1415(1952).

Levels ${}^{17}\text{Li}(d,n)$ $E_d = 0.68$ ppl
 $2.2 ?^*$ 4.1
 2.9 5.0

*Seen for small angles only

$d,n(\theta)$ shows both stripping and compound nucleus formation

B.Trumpy, T.Grottdal, A.Graue, Nature 170, 1118 (1952).

Level ${}^{17}\text{Li}(d, p\beta^-) 2\alpha$ scin
 (~ 3) $I = 2$
 $(12.5\beta) (1.5\alpha) (\theta)$ consistent with $I = 3, 2, 0$

C.M.Class, S.S.Hanna, Phys. Rev. 89, 877(1953).

Resonance ${}^{17}\text{Li}(p, \gamma)$ $\Gamma = 12.2$ kev EA
 0.4415

S.E.Hunt, Proc. Phys. Soc. 65A, 982(1952).

${}^{10}_4\text{Be}$ Capture γ 's ${}^9\text{Be}(n, \gamma)$ pair s
 25^+ 3.41
 75^+ 6.81

No 6.3γ observed

$^+$ Photons per 100 n captures

G.A.Bartholomew, B.B.Kinsey, Can. J. Phys. 31, 49(1953).

Level ${}^{\text{Be}}(d, p)$ ppl
 g.s.

$d, p(\theta)$ for $E_d = 0.295, 0.40, 0.45, 0.52, 0.62$

D.deJong, P.M.Endt, L.J.G.Simons, Physica 18, 676(1952).

${}^{10}_5\text{B}$ μ 1.80114* I
 1.80082**

* $\nu({}^{10}\text{B})/\nu(\text{D}) = 0.700086 \pm 0.00007$

** $\nu({}^{10}\text{B})/\nu(\text{Rb}^{85}) = 1.11282 \pm 0.00005$

$\text{Na}_2\text{B}_2\text{O}_4, \text{D}_2\text{O}, \text{RbCl}$

Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).

Level ${}^{\text{B}}(n, n\gamma)$ $E_n = 2.5$ scin
 γ 0.717

R.B.Day, Phys. Rev. 89, 908A(1953).

${}^{11}_5\text{B}$ ${}^9\text{Be}(d, t)\text{Be}^8$ $E_d = 1.3$ ppl
 $d, t(\theta)$ shows forward peaking suggesting pick-up

P.Cuär, J.J.Jung, Phys. Rev. 89, 1151(1953).

${}^{11}_5\text{B}$ ${}^9\text{Be}(d, t)\text{Be}^8$ ${}^9\text{Be}(d, p)\text{Be}^{10}$
 σ 's equal for $E_d < 0.40$ ppl

D.deJong, P.M.Endt, L.J.G.Simons, Physica 18, 676(1952).

${}^{12}_5\text{B}$ τ 0.022^s B(0.6-Mev d)
 5 7 P.Bretonneau, Compt. rend. 236, 913(1953).

${}^{11}_6\text{C}$ τ 20.25^m ${}^{12}\text{C}(30\text{-Mev } p)$ scin
 6 5 W.M.Martin, S.W.Breckon, Can. J. Phys. 30, 643 (1952).

τ 20.74^m C(21-Mev He^3)
 D.N.Kundu, T.W.Donaven, M.L.Pool, J.K.Long, Phys. Rev. 89, 1200(1953); Physica 18, 1304(1952).

${}^{12}_6\text{C}$ Levels ${}^{11}\text{Li}(d, n)$ $E_d = 8.1$ ppl
 6 6 g.s. $l_p = 1$
 (4.43) $l_p = 1$
 W.M.Gibson, Phil. Mag. 44, 297(1953).

Level ${}^{15}\text{N}(p, \alpha\gamma)$ $E_p = 0.429$ s
 $D, \gamma(\theta); p, \alpha(\theta)$ 0.890, 1.210
 (4.43) $I = 2 +$

A.A.Kraus, Jr., A.P.French, W.A.Fowler, C.C.Lauritsen, Phys. Rev. 89, 299(1953).

Level ${}^{12}\text{C}(p, p\gamma)$ $E_p = 7.1$ scin
 $D, \gamma(\theta)$ (4.43) $I = 2$

H.E.Gove, N.S.Wall, Can. J. Phys. 31, 189(1953).

Level ${}^{12}\text{C}(n, n\gamma)$ $E_n = 5.5$ scin
 γ 4.45

R.B.Day, Phys. Rev. 89, 908A(1953).

Levels ${}^{11}\text{B}(p, \gamma)$ $E_p = 0.7$
 (~ 16.1)

$p, \gamma(\theta)$ for 11.8γ indicates interference between levels of opposite parity

G.L.Jenkins, L.W.Cochran, H.H.Given, J.L.Ryan, T.M.Hahn, B.D.Kern, BAPS 28, 2, DA7(1953).

Levels ${}^{12}\text{C}(\gamma, 3\alpha)$ $E_\gamma \leq 70$ ppl
 18 others? 310 stars
 29

W.K.Dawson, C.B.Bigham, Can. J. Phys. 31, 167 (1953).

${}^{12}\text{C}(\gamma, \alpha)\text{Be}^8$ $E_\gamma = 17.6$ ppl
 $\sigma(\text{Be}^8 \text{ g.s.})/\sigma(\text{Be}^8 \sim 3\text{-Mev level}) = 0.025$ (cf ${}^{16}\text{O}$)

H.Nabholz, P.Stoll, H.Wäffler, Helv. Phys. Acta 25, 701(1952).

${}^{13}_6\text{C}$ Capture γ 's ${}^{12}\text{C}(n, \gamma)$ pair s
 6 7 30^+ 3.68
 70^+ 4.95

No 3.9γ observed ($< 6^+$)

$^+$ Photons per 100 n captures

G.A.Bartholomew, B.B.Kinsey, Can. J. Phys. 31, 44(1953).

C¹⁴ 6 8	F-K plot concave toward energy axis below 50 kev although 8^{35} and Pm^{147} plots linear to 10 kev J.P.Mize, D.J.Zaffarano, BAPS 28, 2 DA6(1953).			
N¹⁴ 7 7	μ 0.40370 I $\nu(N^{14})/\nu(Rb^{85}) = 0.74837 \pm 0.00004$ HNO ₃ , RbCl Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).			
O¹⁵ 8 7	Levels $N^{14}(d,n)$ $E_d = 7.7$ ppl g.s. $l_p = 1$ 5.3 $l_p = 2 ?$ 6.2 $l_p = 1 ?$ 6.8 $l_p = 0$ 7.5 $l_p = 1 ?$ 8.4 $l_p = 1 ?$ 9.1 $l_p = 1 ?$ W.H.Evans, T.S.Green, R.Middleton, Proc. Phys. Soc. 66A, 108(1953).			
O¹⁶ 8 8	Levels $N^{15}(p,\alpha)C^{12}$ scin $D,\gamma(\theta)$ (12.51) $J = 2^-$ (12.95) $J = 2^-$ (13.24) $J = 3^-$ or 4^+ 4.43 γ studied for $E_p = 0.43, 0.90, 1.2$ C.A.Barnes, D.B.James, G.C.Neilson, Can. J. Phys. 30, 717(1952).			
	Levels $N^{15}(p,\alpha)C^{12}$ s $D,\gamma(\theta)$ (12.51) $J = 2^-$ $D,\alpha(\theta)$ (12.95) $J = 2^-$ (13.24) $J = 4^+$ A.A.Kraus, Jr., A.P.French, W.A.Fowler, C.C.Lauritsen, Phys. Rev. 89, 299(1953).			
	Levels $O^{16}(n,n)$ $E_n = 14.1$ cc (~6 Mev excitation)/(~12 Mev excitation) ~5 J.P.Conner, Phys. Rev. 89, 712(1953).			
	$O^{16}(\gamma,\alpha)C^{12}$ $E_\gamma = 17.6$ ppl $\sigma(C^{12} \text{ g.s.})/\sigma(C^{12} \text{ 4.4-Mev level}) > 90$ (cf C^{12}) $\sigma(C^{12} \text{ g.s.}) = 2.0 \times 10^{-4}$ H.Nabholz, P.Stoll, H.Wäffler, Helv. Phys. Acta 25, 701(1952).			
O¹⁷ 8 9	Level $N^{14}(\alpha,p)$ $E_\alpha = 4.80$ ppl 0.86 E.Hjalmar, H.Siätis, Phys. Rev. 89, 1151(1953).			
	$O^{16}(n,n)$ $E_n = 14.1$ cc $n,n(\theta)$ asymmetrical for elastic n's, ~symmetrical for inelastic J.P.Conner, Phys. Rev. 89, 712(1953).			
F¹⁹ 9 10	γ 's $F^{19}(n,\gamma)$ $E_n = 2.5$ scin 0.084 0.114 0.199 1.36 R.B.Day, Phys. Rev. 89, 908A(1953).			
F²⁰ 9 11	Levels $F^{19}(d,p)$ $E_d = 3.6$ 1c $d,p(\theta)$ g.s. $l_n = 0$ and 2 (0.65) $l_n = 2$ (~2.05) $l_n = 2$ (~3.49) $l_n = 0$ D.A.Bromley, J.A.Bruner, H.W.Fulbright, Phys. Rev. 89, 396(1953).			
Ne²⁰ 10 10	Resonances $F^{19}(p,\alpha\gamma)$ EA 0.3404 $\Gamma = 2.9$ kev 0.4831 $\Gamma = 2.2$ kev S.E.Munt, Proc. Phys. Soc. 65A, 982(1952).			
	Level $Na^{23}(p,\alpha)$ $E_p = 1.46, 2.92$ EA 1.634 D.J.Donahue, K.W.Jones, M.T.McEllistrem, H.T.Richards, Phys. Rev. 89, 824(1953).			
	Level $F^{19}(p,\gamma)$ $E_p = 0.70$ scin (>7.5 γ) (γ) 1.66 G.A.Jones, D.H.Wilkinson, Proc. Phys. Soc. 65A, 1055(1952).			
	Levels $O^{16}(\alpha,\alpha)$ $\alpha,\alpha(\theta)$ 6.738 $J = 0$ 7.182 $J = 3$ 7.218 $J = 0$ 7.450 $J = 2$ 7.854 $J = 2$ J.R.Cameron, R.H.Davis, A.S.Divatia, F.J.Eppling, R.W.Hill, Phys. Rev. 89, 909A(1953).			
Na	Neutron resonance (ev) $E_n = 1$ ev to 10 kev ~3500 $\sigma_0 \Gamma^2 = 58 \times 10^6$ E.R.Hodgson, J.F.Gallagher, E.M.Bowey, Proc. Phys. Soc. 65A, 992(1953).			
Na²² 11 11	(0.55 β^+)/(1.82 β^+) ~1800 s B.T.Wright, Phys. Rev. 89, 902A(1953).			
Na²³ 11 12	Level $Na^{23}(p,p)$ $E_p = 1.46$ EA 0.439 D.J.Donahue, K.W.Jones, M.T.McEllistrem, H.T.Richards, Phys. Rev. 89, 824(1953).			
Na²⁴ 11 13	I 4 M μ +1.690 $\Delta F = \pm 1, \Delta m = \pm 1$ transitions studied $\Delta\nu(Na^{24})/\Delta\nu(Na^{23}) = 1139.35/1771.61$ E.H.Bellamy, K.F.Smith, Phil. Mag. 44, 33(1953).			

Mg^{24}
 $12 \quad 12$ Level $Mg(n,n\gamma)$ $E_n = 2.5$
 γ 1.365 scin

R.B. Day, Phys. Rev. 89, 908A(1953).

Level $Mg(d,p)$ $E_p = 2.41$ EA
 1.371 \pm 0.002

D.J. Donahue, K.W. Jones, M.T. McEllistrem, H.T. Richards, Phys. Rev. 89, 824(1953).

Capture γ 's $Na^{23}(p,\gamma)$ $E_p = 0.305$ scin
 $28 \uparrow$ 1.38 $\leq 5 \uparrow$ 5.8
 $\leq 4 \uparrow$ 2.41 ? $\leq 2 \uparrow$ 6.2
 $24 \uparrow$ { 2.88 ? 20 \uparrow { 6.8
 ~ 3.6 { 7.5
 4.2 11 \uparrow 10.3

H. Casson, Phys. Rev. 87, 215A(1952); 89, 809 (1953).

Mg^{25}
 $12 \quad 13$ Levels $Mg^{24}(d,p)$ $E_d = 8$ pc
 $d,p(\theta)$ 15.4 \uparrow g.s. $l_n = 2$
 6.2 \uparrow (0.58) $l_n = 0$
 6.2 \uparrow (0.98) $l_n = 0$
 (1.61) isotropic
 5.5 \uparrow (1.96) $l_n = 2$
 (~ 2.7) $l_n = 0$
 8.7 \uparrow (3.40) $l_n = 1$
 4.62
 5.05
 5.49
 6.40

J.R. Holt, T.N. Marsham, Proc. Phys. Soc. 66A, 258 (1953).

Mg^{26}
 $12 \quad 14$ Levels $Mg^{25}(d,p)$ $E_d = 8$ pc
 $d,p(\theta) \sim 2 \uparrow$ g.s.
 13 \uparrow (1.83) $l_n = 0$ (60%), 2 (40%)
 5.7 \uparrow (2.97) $l_n = 0$
 6.1 \uparrow (3.97) $l_n = 0$
 5.8 \uparrow (4.35) $l_n = 0$
 3.3 \uparrow (6.15) $l_n = 0$
 7.29
 8.28

J.R. Holt, T.N. Marsham, Proc. Phys. Soc. 66A, 258 (1953).

Mg^{27}
 $12 \quad 15$ τ 9.39^m \pm 0.03 $Mg(pile n)$
 Counted with β electroscop

K.J. Bobin, E.E. Lockett, quoted by E.E. Lockett, R.N. Thomas, Nucleonics 11, No. 3, 14(1953).

τ 9.45^m \pm 0.03 $Mg(pile n)$
 Counted with β electroscop

S.W. Sargent, L. Yaffa, A.P. Gray, Can. J. Phys. 31, 235(1953).

Levels $Mg^{26}(d,p)$ $E_d = 8$ pc
 $d,p(\theta)$ 2.8 \uparrow g.s. $l_n = 0$
 4.8 \uparrow (0.99) $l_n = 2$
 3.50 $l_n = 0$

J.R. Holt, T.N. Marsham, Proc. Phys. Soc. 66A, 258(1953).

Mg^{28}
 $12 \quad 16$ τ 21.3^h p 2.3^mAl $Mg(39-Mev \alpha)$
 S1 ($\leq 100-Mev \gamma$) chem

R.K. Shellina, N.R. Johnson, Phys. Rev. 89, 520(1953).

τ 21^h p 2.3^mAl Cl(340-Mev p),
 β^- ~ 0.4 chem
 γ < 0.1

M. Lindner, Phys. Rev. 89, 1150(1953).

Al^{25}
 $13 \quad 12$ Levels $Mg^{24}(d,n)$ $E_d = 3.97$ p d l
 $d,n(\theta)$ g.s. $l_p = 2$
 0.45 $l_p = 0$
 0.95 $l_p = 1$ or 2
 1.81
 1.94 ?
 2.51
 2.70
 2.92 ?
 3.09

E. Goldberg, Phys. Rev. 88, 159A(1952); 89, 760 (1953).

Capture γ 's $Mg(d,\gamma)$ $E_p = 0.27$ scin
 $\sim 8 \uparrow$ 0.48
 $6 \uparrow$ 1.95
 $2 \uparrow$ 2.35

No higher energy γ 's observed

H. Casson, Phys. Rev. 87, 215A(1952); 89, 809 (1953).

Al^{27}
 $13 \quad 14$ Level $Al^{27}(p,p)$ $E_p = 2.31$ EA
 0.843

D.J. Donahue, K.W. Jones, M.T. McEllistrem, H.T. Richards, Phys. Rev. 89, 824(1953).

Levels $Al^{27}(n,n\gamma)$ $E_n = 2.5$ scin
 γ 0.843
 1.018
 2.20

R.B. Day, Phys. Rev. 89, 908A(1953).

Si^{28}
 $14 \quad 14$ Capture γ 's $Al^{27}(p,\gamma)$ $E_p = 0.325, 0.404$
 $12 \uparrow$ 1.81 $\sim 14 \uparrow$ { 7.1 scin
 $12 \uparrow$ 2.82 { 7.5
 $5 \uparrow$ { 4.65
 5.0

H. Casson, Phys. Rev. 87, 215A(1952); 89, 809 (1953).

Si^{29}
 $14 \quad 15$ Levels $Si^{28}(d,p)Si^{29}$ $E_d = 8$ pc
 $d,p(\theta)$ Level l_n
 g.s. 0
 (1.28) 2
 (2.03) 2
 (3.07) 2
 (3.62) 3
 (4.93) 1
 (6.38) 1

J.R. Holt, T.N. Marsham, Phys. Rev. 89, 665(1953).

Si³²
14 18 $\tau \leq 2.6^h$ or $> 100^y$ Cl(340-Mev p),
2.6^hSi³¹ observed in high abundance chem
M.Lindner, Phys. Rev. 89, 1150(1953).

P³⁰
15 15 τ 2.52^m Al(α ,n)
K.Baskova, A.Kudrjavtseva, Zhur. Eksp'tl' i
Teoret. Fiz. 23, 483(1952).

P³²
15 17 τ 14.50^d ± 0.04 P(pile n)
Counted for 5 half-lives with β electro-
scope
No estimate of P³³ contamination given
E.E.Lockett, R.H.Thomas, Nucleonics 11, No. 3,
14(1953).
 $\bar{E}_\beta = 0.694 \pm 0.025$ ic and 4π counter
J.M.Brabant, L.W.Cochran, R.S.Caswell, BAPS 28,
2, DA 5(1953).
Continuous γ spectrum scin
 $\gamma(E_\gamma > 0.09) / \beta^- = 0.0023$
P.Boigiano, L.Madansky, F.Rasetti, Phys. Rev.
89, 679(1953).

S³²
16 16 Level S(n,n γ) $E_n = 2.5$ scin
 γ 2.23
R.B.Day, Phys. Rev. 89, 908A(1953).

S³³
16 17 Levels S³²(d,p)S³³ $E_d = 8$ pc
d,p(θ)

Level g.s.	$\frac{l}{2}$ n-
(0.85)	0
(2.90)	3
(3.28)	1
(4.21)	1
(4.89)	1
(5.72)	1

J.R.Holt, T.N.Marsham, Phys. Rev. 89, 665(1953).

Cl³³
17 16 Levels S(d,n) $E_d = 8$ ppl
d,n(θ)

g.s.	$l_p = 2$
0.76	$l_p = 0$
~ 1.89	
2.84	$l_p = 1$
4.22	$l_p = 1$

R.Middleton, F.A.El-Bedewi, C.T.Tal, Proc. Phys.
Soc. 66A, 95(1953).

Cl³⁵
17 18 μ 0.82111 I
 $\nu(\text{Cl}^{35})/\nu(\text{Rb}^{85}) = 1.01481 \pm 0.00005$
 $\mu(\text{Cl}^{35})/\mu(\text{Cl}^{37}) = 1.20128 \pm 0.00006$
LiCl, RbCl
Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).

Cl³⁷
17 20 μ 0.68352 I
 $\nu(\text{Cl}^{37})/\nu(\text{Rb}^{85}) = 0.84477 \pm 0.00005$
LiCl, RbCl
Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).

K⁴²
19 23 I 2 M
 μ -1.137
 $\Delta F = \pm 1$, $\Delta m = \pm 1$ transitions studied
 $\Delta\nu(K^{42})/\Delta\nu(K^{39}) = 1258.9/461.75$
 $\mu(K^{39}) = 0.391$
E.H.Bellamy, K.F.Smith, Phil. Mag. 44, 33(1953).

Ca⁴⁵
20 25 τ 164^d Ca(pile n)
C.F.G.Delaney, J.H.J.Poolo, Phys. Rev. 89, 529
(1953).

Sc⁴¹
21 20 τ 0.873^s Ca(30-Mev p) scin
W.M.Martin, S.W.Breckon, Can. J. Phys. 30, 643
(1952).

Sc⁴⁶
21 25 $\beta^- \leq 0.1\%$ ≤ 1.2 π
85^d γ (0.88) $\alpha = 1.9 \times 10^{-4}$
(1.11) $\alpha = 0.88 \times 10^{-4}$
J.A.Whalen, F.T.Porter, C.S.Cook, Phys. Rev.
89, 902A(1953).

γ (0.88) $\tau < 2^{\mu s}$ $\beta\gamma$
(1.11) $\tau < 2^{\mu s}$ $\beta\gamma$

S.Kolicki, R.Ballini, R.Chaminade, Compt. rend.
236, 1155(1953).

γ 0.885 Sc(pile n)
1.119 $\pi^+ 2^-$ pe^-
T.Lindquist, Arkiv Fysik 6, 123(1953).

Capture γ 's Sc⁴⁵(n, γ) pair s

2 ⁺	6.35	5 ⁺	8.18
2.5 ⁺	6.84	1 ⁺	8.31
0.7 ⁺	7.15	2.5 ⁺	8.54
1 ⁺	7.65	0.3 ⁺	8.85

†Photons per 100 n captures

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386
(1953).

Tl Capture γ Tl(n, γ) pair s
1.4⁺ 4.67
Isotopic assignment uncertain
†Photons per 100 n captures
B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375
(1953).

Tl⁴⁸
22 26 Capture γ 's Tl(n, γ) pair s

1.5 ⁺	7.38 ?
0.4 ⁺	8.27 ?
0.1 ⁺	9.39 ?

Assignment assuming n binding = 11.63,
9.39 γ to 2.31 β decay level

†Photons per 100 n captures in Tl

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375
(1953).

Ti^{49} 22 27	Capture γ 's	$Ti(n,\gamma)$	pair s
	5 ⁺	4.88	
	3.5 ⁺	4.96	
	0.4 ⁺	5.65 ?	
	32 ⁺	6.412	
	4 ⁺	6.53	
	53 ⁺	6.756	

Assignment from agreement with d,p results
⁺Photons per 100 n captures in Ti

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Ti^{50} 22 28	Capture γ 's	$Ti(n,\gamma)$	pair s
	53 ⁺	6.756 ? (also Ti^{49})	
	0.6 ⁺	7.80 ?	
	0.2 ⁺	9.19 ?	

Assignment assuming n binding = 10.8,
 9.19 γ to 1.58 d,p level

⁺Photons per 100 n captures in Ti

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Ti^{51} 22 29	τ	5.79 ^m ± 0.03	$Ti(pile\ n)$
	Counted for 8 half-lives in β electroscop		
	B.W.Sargent, L.Yaffe, A.P.Gray, Can. J. Phys. 31, 235 (1953).		

τ 5.9^m
 Mass assignment confirmed by
 Ca^{48} (20-Mev α), Ti^{50} (slow n),
 Cr^{54} (fast n), V^{51} (fast n)

W.R.Hammond, D.N.Kundu, M.L.Pool, Phys. Rev. 90, 157 (1953).

V^{46} 23 23	τ	0.40 ^s	$Ti(15\text{-Mev } p)$
	β^+	~ 6	scin bias
	W.W.Martin, S.W.Breckon, Can. J. Phys. 30, 643 (1952).		

V^{51} ? 23 28	Capture γ 's	$V(n,\gamma)$	pair s
	0.3 ⁺	7.67	
	1.3 ⁺	7.83	
	0.5 ⁺	7.98	

E_γ greater than V^{51} n binding
 γ intensity implies $\sigma_a(V^{50}) = 40-400$
⁺Photons per 100 n captures in V

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386 (1953).

V^{52} 23 29	τ	3.76 ^m ± 0.02	$V^{51}(pile\ n)$
	Counted for 5 half-lives in β electroscop		

B.W.Sargent, L.Yaffe, A.P.Gray, Can. J. Phys. 31, 235 (1953).

Levels	$V^{51}(d,p)$	$E_d = 7.8$	pc
d,p(θ)	G.S.	$I_n = 1(\geq 75\%), 3(\leq 25\%)$	
	(0.79)	$I_n = 1$	
	(1.6)	$I_n = 1$	

J.S.King, W.C.Parkinson, Phys. Rev. 89, 1080 (1953); BAPS 28, 1, W9(1953).

V^{52} 23 29	Capture γ 's	$V(n,\gamma)$	pair s
	2 ⁺	3.39	10 ⁺ 5.511
	3 ⁺	3.59	9 ⁺ 5.744
	3 ⁺	3.73	3 ⁺ 5.88
	4 ⁺	4.15	25 ⁺ 6.508
	3 ⁺	4.45	0.7 ⁺ 6.62
	2 ⁺	4.85	14 ⁺ 6.868
	2 ⁺	4.98	18.5 ⁺ 7.154
	6 ⁺	5.21	11 ⁺ 7.305

⁺Photons per 100 n captures in V

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386 (1953).

Cr	Capture γ 's	Cr(n, γ)	pair s
	0.5 ⁺	3.72	3.0 ⁺ 6.644
	0.6 ⁺	4.83	0.6 ⁺ 6.872
	1 ⁺	5.26	2.6 ⁺ 7.097
	2 ⁺	5.61	0.2 ⁺ 7.21
	1 ⁺	6.00	0.2 ⁺ 7.54
	0.7 ⁺	6.12	0.2 ⁺ 7.67
	0.9 ⁺	6.26	7 ⁺ 8.499
	0.3 ⁺	6.358	

Isotopic assignment uncertain

⁺Photons per 100 n captures

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Cr^{51} 24 27	γ	0.330	pc
	No lower energy γ		
	A.L.Cockroft, quoted by S.C.Curran, Physica 18, 1161 (1953).		

Cr^{53} 24 29	Levels	$Cr^{52}(d,p)$	$E_d = 10.2$	dpl
		0.54	3.20	
		0.97	3.65	
		1.29	4.10	
		2.66		

C.E.McFarland, M.W.Bretscher, F.B.Shull, Phys. Rev. 89, 892A (1953).

	Capture γ 's	Cr(n, γ)	pair s
	3 ⁺	7.364	
	4 ⁺	7.929	

Assignment from agreement with d,p results
⁺Photons per 100 n captures in Cr

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

No reaction Fe(th n, σ) $\sigma < 10^{-5}$ ppl
 H.Faraggi, J. phys. radium 14, 160 (1953).

Cr^{54} 24 30	Capture γ 's	Cr(n, γ)	pair s
	19 ⁺	8.881	
	7 ⁺	9.716	

Assignment from masses and Mn^{54} 0.835y
⁺Photons per 100 n captures in Cr

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Mn^{50}
25 25 τ 0.28^s Cr(17-Mev p)
 β^+ ~6.3 scin bias
W.M.Martin, S.W.Breckon, Can. J. Phys. 30, 643 (1952).

Mn^{55}
25 30 Q ~0.5 Mic
A.Javan, G.Silvey, C.H.Townes, A.V.Grosse, BAPS 28, 2, J8(1953).

Mn^{56}
25 31 τ 2.576^h ± 0.002 Mn(th n)
Counted for 11 half-lives 4π counter
R.M.Bartholomew, R.C.Hawkins, W.F.Merritt, L.Yaffe, Can. J. Chem 31, 204(1953).

τ 2.574^h ± 0.003 Mn(pile n)
Counted for 4 half-lives with β electroscopie
E.E.Lockett, R.H.Thomas, Nucleonics 11, No. 3, 14(1953).

Capture γ 's	Mn^{55} (n, γ)	pair s
1 ⁺	3.82	0.3 ⁺ 5.63
1 ⁺	4.10	1 ⁺ 5.77
2 ⁺	4.24	0.5 ⁺ 5.91
2 ⁺	4.55	1 ⁺ 6.11
2 ⁺	4.72	0.5 ⁺ 6.43
2 ⁺	4.81	2.5 ⁺ 6.779
3 ⁺	5.04	3.5 ⁺ 7.048
3 ⁺	5.21	4 ⁺ 7.15
4 ⁺	5.53	12 ⁺ 7.261

⁺Photons per 100 n captures

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386 (1953).

γ 's	Fe (n, γ)	$E_n = 14$	scin
	3.3		
	4.4		
	5.8		
	7.1		
	8.75		

Spectrum continuous below 3 Mev

V.E.Scherrer, R.Theus, W.R.Faust, Phys. Rev. 89, 1268(1953).

Capture γ 's	Fe (n, γ)	pair s
2.0 ⁺	3.43	
0.5 ⁺	3.86	
2 ⁺	4.21	
1 ⁺	4.44	
1 ⁺	4.81	
0.4 ⁺	6.369	

Isotopic assignment uncertain

⁺Photons per 100 n captures

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Fe^{55}
26 29 E_{dis} 0.20 scin
from continuous γ endpoint

P.Boligiano, L.Madansky, F.Rasetti, Phys. Rev. 89, 679(1953).

E_{dis} 0.22 scin
from continuous γ endpoint

A.Michalowicz, J. phys. radium 14, 214(1953).

Fe^{55}
26 29 No e^- ($< 6 \times 10^{-5}\%$) between 0.030 and 0.20
 Mn^{55} (10-Mev d,2n) chem
F.T.Porter, H.P.Hotz, Phys. Rev. 89, 938(1953).

Capture γ 's	Fe (n, γ)	pair s
0.8 ⁺	8.345	
0.5 ⁺	8.872	
2.7 ⁺	9.298 (also Fe^{58} ?)	

Assignment from agreement with d,p and p,n results

⁺Photons per 100 n captures in Fe

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

γ	Fe (n, γ)	$E_n = 1.23$	scin
	(0.85)		

B.Rose, J.M.Freeman, Proc. Phys. Soc. 66A, 120 (1953).

γ 's	Fe (n, γ)	$E_n = 14$	scin
	0.85		
	1.25		

L.C.Thompson, Phys. Rev. 89, 905A(1953).

γ 's	Fe (n, γ)	$E_n = 2.5$	scin
	0.85		
	1.25		
	1.42 (Fe^{57} ?)		

R.B.Day, Phys. Rev. 89, 908A(1953).

Capture γ 's	Fe (n, γ)	pair s
0.5 ⁺	4.968	
5.2 ⁺	5.914	
5.8 ⁺	6.015	
3.5 ⁺	7.285	
3.6 ⁺	7.639	

Assignment from agreement with d,p results
⁺Photons per 100 n captures in Fe

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Capture γ 's	Fe (n, γ)	pair s
2.7 ⁺	9.298 (also Fe^{58} ?)	
0.1 ⁺	10.16	

Assignment from masses and Co^{58} decay

⁺Photons per 100 n captures in Fe

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

γ	E_n	$s\pi$ cpt
58 ⁺	1.10	
42 ⁺	1.28	

No other γ (0.5 to 2.1) $< 10\%$

B.S.Dzhelelov, N.N.Zhukovskii, V.V.Khol'nov, Doklady Akad. Nauk SSSR 86, 497(1952).

τ	β^+	Fe (17-Mev p)
~0.18 ^s	~7.4	scin bias

W.M.Martin, S.W.Breckon, Can. J. Phys. 30, 643 (1952).

$^{57}_{27}\text{Co}$ $^{30}_{10}$ I $7/2$ para
 μ 4.6

J.W.Baker, B.Bleaney, K.D.Bowers, P.F.D.Shaw,
R.S.Trenam, Proc. Phys. Soc. 66A, 305(1953).

$^{58}_{27}\text{Co}$ $^{31}_{12}$ 72^d d 9.2^hCo chem
 72^d

D.C.Hoffman, D.S.Martin Jr., J. Phys. Chem. 56,
1097(1952).

$^{60}_{27}\text{Co}$ $^{33}_{14}$ 5.2^y τ_2 $4.95^y \pm 0.04$ Co(pile n)
Counted for 8 months with β electroscopes
E.E.Lockett, R.H.Thomas, Nucleonics 11, No. 3,
14(1953).

γ 1.1728 K/LM \sim 10 $s\pi$ ce_K^-
1.3325 K/LM \sim 10

Energy calibration from authors' new
absolute measurement of 1.12 and
1.41 γ 's of Bi^{214}

G.Lindström, A. Hedgran, D.E.Aiburger, Phys.
Rev. 89, 1303(1953).

$\gamma\gamma(\theta)$, $\gamma\gamma$ polarization-direction
I = 4+, 2+, 0+

J.J.Kraushaar, M.Goldhaber, Phys. Rev. 89, 1081
(1953).

$^{60}_{27}\text{Co}$ $^{33}_{14}$ Capture γ 's $^{60}_{27}\text{Co}(n,\gamma)$ pair s
1 $^+$ 3.36 5.6 $^+$ 5.966
0.7 $^+$ 3.69 0.5 $^+$ 6.11
1 $^+$ 4.03 0.7 $^+$ 6.250
0.8 $^+$ 4.18 5 $^+$ 6.474
1 $^+$ 4.37 6 $^+$ 6.690
0.6 $^+$ 4.59 7 $^+$ 6.867
2.5 $^+$ 4.903 2.5 $^+$ 6.97
2 $^+$ 5.18 1.3 $^+$ 7.04
0.7 $^+$ 5.35 4.0 $^+$ 7.201
6.3 $^+$ 5.646 3.0 $^+$ 7.486
1.7 $^+$ 5.73

$^+$ Photons per 100 n captures

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386
(1953).

Ni Capture γ 's Ni(n, γ) pair s
3 $^+$ 5.82 9 $^+$ 6.84
0.3 $^+$ 5.99 0.5 $^+$ 7.05
1.0 $^+$ 6.10 0.5 $^+$ 7.22
0.6 $^+$ 6.34 2.8 $^+$ 8.12
2.0 $^+$ 6.58

Isotopic assignment uncertain
 $^+$ Photons per 100 n captures

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375
(1953).

$^{59}_{28}\text{Ni}$ $^{31}_{13}$ Levels $^{58}_{28}\text{Ni}(d,p)$ $E_d = 10.2$ ppl
0.42 5.20
3.08 5.66
4.57

C.E.McFarland, M.W.Bretscher, F.B.Shull, Phys.
Rev. 89, 892A(1953).

$^{59}_{28}\text{Ni}$ $^{31}_{13}$ Capture γ 's Ni(n, γ) pair s
1 $^+$ 5.31
0.4 $^+$ 5.70
14 $^+$ 8.532 (also Ni^{61} ?)
35 $^+$ 8.997

Assignment from agreement with d,p results
 $^+$ Photons per 100 n captures in Ni

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375
(1953).

$^{61}_{28}\text{Ni}$ $^{33}_{15}$ Capture γ 's Ni(n, γ) pair s
4 $^+$ 7.528
6.5 $^+$ 7.817
14 $^+$ 8.532 (also Ni^{59} ?)

Assignment from agreement with d,p results
and Cu^{61} decay

$^+$ Photons per 100 n captures in Ni

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375
(1953).

$^{63}_{28}\text{Ni}$ $^{35}_{17}$ F-K plot concave toward energy axis below
30 kev although S^{35} and Pm^{147} plots linear
to 10 kev

J.P.Wize, D.J.Zaffarano, BAPS 28, 2, DA 6(1953).

Cu Capture γ 's Cu(n, γ) pair s
0.7 $^+$ 5.07 0.2 $^+$ 5.75
0.6 $^+$ 5.18 1 $^+$ 6.05
1 $^+$ 5.31 1 $^+$ 6.41
1 $^+$ 5.43 1 $^+$ 7.16
0.5 $^+$ 5.64

Isotopic assignment uncertain
 $^+$ Photons per 100 n captures

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386
(1953).

$^{58}_{29}\text{Cu}$ $^{29}_{10}$ τ 3.04 s Ni(15-Mev p)
W.M.Martin, S.W.Breckon, Can. J. Phys. 30, 643
(1952).

$^{64}_{29}\text{Cu}$ $^{35}_{16}$ Capture γ 's Cu(n, γ) pair s
3 $^+$ 6.69
2 $^+$ 7.01
5.5 $^+$ 7.296
20 $^+$ 7.914

Assignment from agreement with d,p results
 $^+$ Photons per 100 n captures in Cu

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386
(1953).

$^{66}_{29}\text{Cu}$ $^{37}_{18}$ τ 5.10 m Cu(slow n)
Counted with β electroscopes

B.W.Sargent, L.Yaffe, A.P.Gray, Can. J. Phys.
31, 235(1953).

Capture γ Cu(n, γ) pair s
9 $^+$ 7.634 ?

Assignment from agreement with unpublished
d,p results, but disagrees with $\text{Zn}^{66}(\gamma,n)$
 $^+$ Photons per 100 n captures in Cu

G.A.Bartholomew, B.B.Kinsey, Phys. Rev. 89, 386
(1953).

Zn	Capture γ 's	Zn(n, γ)	pair s
	1.2 ⁺	4.14	0.3 ⁺ 6.26
	1.6 ⁺	4.84	1 ⁺ 6.49
	0.7 ⁺	5.23	0.5 ⁺ 6.65
	2.6 ⁺	5.48	2.7 ⁺ 6.94
	1 ⁺	5.77	2.0 ⁺ 7.19
	0.8 ⁺	6.03	

Isotopic assignment uncertain

⁺Photons per 100 n captures

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Zn ⁶² 30 32	τ	8.4 ^h	Ni(13-Mev He ³)
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D.N.Kundu, T.W.Donaven, M.L.Pool, J.K.Long, Phys. Rev. 89, 1201(1953); Physica 18, 1304 (1952).

Zn ⁶⁵ 30 35	γ	0.20 ?	scin
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1.11 γ/β^+ = 38 0.20 γ/β^+ = 0.5

R.Bouchez, N.Perrin, quoted by R.Bouchez, Physica 18, 1171(1952).

Capture γ	Zn(n, γ)	pair s
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10⁺ 7.876Assignment from agreement with d,p results
⁺Photons per 100 n captures in Zn

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953).

Zn ⁶⁸ 30 38	Capture γ 's	Zn(n, γ)	pair s
	0.6 ⁺	8.31	
	0.2 ⁺	8.58	
	0.2 ⁺	8.98	
	1 ⁺	9.12	
	0.07 ⁺	9.51	

Assigned here since $E_\gamma > n$ binding in other Zn's⁺Photons per 100 n captures in Zn

B.B.Kinsey, G.A.Bartholomew, Phys. Rev. 89, 375 (1953)

Zn ⁶⁹ 30 39 13.8 ^h	γ	0.435	$\alpha = 0.06$ sl ce ⁻ , scin
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R.B.Duffield, L.M.Langer, Phys. Rev. 89, 854 (1953).

52 ^m	β^-	100%	0.897	sl
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R.B.Duffield, L.M.Langer, Phys. Rev. 89, 854 (1953).

Ga ⁶⁵ 31 34	τ	15 ^m	Cu(21-Mev He ³)
	β^+	2.1	

M.L.Pool, Physica 18, 1304(1952).

 β^+ 2.2 Zn(6-Mev d) chem; a

A.H.W.Aten, Jr., H.de Wils, M.Boelhouwer, Physica 18, 1032(1952).

Ga ⁶⁷ 31 36	γ	(0.092) $\tau \sim 350\mu^s$	scin
		(0.18 γ) (0.30 γ)	Cu(21-Mev He ³)

M.L.Pool, Physica 18, 1304(1952).

32	46	Ge ⁷⁸	τ	86 ^m	U ²³⁵ (pile n,f) chem; pc	
					N. Sugarman, Phys. Rev. 89, 570(1953).	
33	37	As ⁷⁰	τ	52 ^m	Ge(26-Mev d) chem	
			β^+	2.7		a
			γ	1.04*		scin
				1.7 ?*		
				2.0*		
			K/ β^+	<0.2	$\gamma/\beta^+ \sim 2$	
					B.Verkerk, A.H.W.Aten, Jr., Physica 18, 974(1952); *A.H.Wapstra, N.F.Verster, Ibid.	
33	42	As ⁷⁵	μ	1.43524		I
			$\nu(\text{As}^{75})/\nu(\text{O})$	$= 1.11589 \pm 0.00005$		
					Na ₂ HAsO ₄ , D ₂ O	
					Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).	
33	43	As ⁷⁶	γ	0.56 (E)2		$\gamma\gamma(\theta)$
				0.65 (M)1	(20-60%)	$\gamma\gamma(\theta)$
				1.21		
				2.1		
				(0.65 γ) (0.56 γ) (θ)	I = 2,2,0 As(slow n) scin	
					J.J.Kraushaar, M.Goldhaber, Phys. Rev. 89, 1081 (1953).	
33	44	As ⁷⁷	τ	38.0 ^h	U ²³⁵ (pile n,f) chem; pc	
					N.Sugarman, Phys. Rev. 89, 570(1953).	
33	45	As ⁷⁸	τ	91.0 ^m	d 86 ^m Ge ⁷⁸ U ²³⁵ (pile n,f) chem; pc	
				No $\sim 40^m$ activity observed		
					N.Sugarman, Phys. Rev. 89, 570(1953).	
35	44	Br ⁷⁹	$\mu(\text{Br}^{81})/\mu(\text{Br}^{79})$	$= 1.07794$		M
			q	0.335		
			$q(\text{Br}^{79})/q(\text{Br}^{81})$	$= 1.19707$		
				J.G.King, V.Jaccarino, BAPS 28, 2, DAL(1953).		
35	46	Br ⁸¹	$\mu(\text{Br}^{81})/\mu(\text{Br}^{79})$	$= 1.07794$		M
			q	0.280		
			$q(\text{Br}^{79})/q(\text{Br}^{81})$	$= 1.19707$		
				J.G.King, V.Jaccarino, BAPS 28, 2, DAL(1953).		
35	52	Br ⁸⁷	n	2%	U(n,f) chem	
			β^-	70% 2.6		a $\beta\gamma$
				30% 8.0		a
			γ	80 ⁺ 2 - 4		
				20 ⁺ 5.4		
					A.F.Stehney, N.Sugarman, Phys. Rev. 89, 194(1953).	
37	45	Rb ⁸² ?	τ	76 ^s	d 25.5 ^d Sr.	a
			β^+	4.2		
				β^+ observed in 25.5 ^d Sr but assigned here		
					P.Kruger, N.Sugarman, Phys. Rev. 90, 158(1953).	

Rb⁸⁴
37 47
23^m τ_1 25⁺ 0.239 Rb (fast n) 1on chem
 γ 10⁺ 0.463 scin
(0.23 γ) (0.23 γ) No (0.23 γ) (0.46 γ)
No x rays observed pc

R.S. Caird, A.C.G. Mitchell, Phys. Rev. 89, 573 (1953).

Sr⁸²?
38 44 τ 25.5^d Ag (450-Mev p) chem
Parent 76^sRb; not p 6.3^hRb (<1%) chem
P. Kruger, N. Sugarman, Phys. Rev. 90, 158 (1953).

Sr⁸⁹
38 51 Levels Sr (d,p) $E_d = 10.4$ s
1.07
2.07
2.54
C.E. McFarland, F.B. Shull, Phys. Rev. 89, 489 (1953).

Sr⁹¹
38 53 β^- 7% 0.62 U(n,f) s π
33% 1.093
29% 1.355
5% 2.03
29% 2.665 $\Delta I = 2$, yes shape
 γ 0.5512 K/LM = 6.0
0.63
0.747
1.025
1.413

D.P. Ames, M.E. Bunker, L.M. Langer, B.M. Sorenson, Phys. Rev. 89, 903A (1953).

Y⁹¹
39 52 τ_1 50.3^m d 9.7^hSr
51^m D.P. Ames, M.E. Bunker, L.M. Langer, B.M. Sorenson, Phys. Rev. 89, 903A (1953).

Y⁹¹
57^d τ_2 61^d
 β^- 1.54 $\Delta I = 2$, yes shape scin
1.16 γ observed with $\tau \sim 160^d$ No (1.16 γ) (β)
F.I. Boley, D.S. Dunavan, Phys. Rev. 90, 158 (1953).

Continuous γ spectrum scin
 $\gamma(E_\gamma > 0.09) / \beta^- = 0.0019$
P. Bolgiano, L. Madansky, F. Rasetti, Phys. Rev. 89, 679 (1953).

Y⁹²
39 53 Mass assignment of 3.5^h activity confirmed
from Zr (7.8-Mev d, α) yields
G.L. Schott, W.W. Meinke, Phys. Rev. 89, 1156 (1953).

Y⁹⁴
39 55 Mass assignment of 16.5^m activity confirmed
from Zr (7.8-Mev d, α) yields
G.L. Schott, W.W. Meinke, Phys. Rev. 89, 1156 (1953).

Zr⁸⁹
40 49 τ_1 4.25^m Zr (≤ 24 -Mev γ)
4.5^m L. Katz, R.G. Baker, R. Montalbetti, Can. J. Phys. 31, 250 (1953).

Zr⁸⁹
80^h τ_2 78^h Zr (≤ 24 -Mev γ)
L. Katz, R.G. Baker, R. Montalbetti, Can. J. Phys. 31, 250 (1953).

Zr⁹⁵
40 55 β^- 99% 0.370 Zr (pile n) 1on chem
1% 0.84 s
 γ 0.721 $\alpha = 0.0024$ s β^- , ce^-
No 0.92 γ

H. Siätis, L. Zappa, Arkiv Fysik 6, 81 (1953).

β^- 54% 0.364 s
43% 0.396

γ 0.722 $\alpha_K = 0.0014^*$ s ce^-
0.754 $\alpha_K = 0.0011^*$

$\beta\gamma$ (θ) $b = 0.00 \pm 0.03$

P.S. Mittelman, BAPS 28, 3, U10 (1953); *verbal report.

γ 0.73 U(n,f) chem; scin
(β) (0.73 γ) indicates $\gamma/\beta \sim 1$

C.E. Mandeville, E. Shapiro, R.I. Mendenhall, E.R. Zucker, G.L. Conklin, Phys. Rev. 89, 559 (1953).

Nb⁹⁰
41 49 τ 14.7^h d 5.7^hMo chem
 β^+ 1.2 Al a
Absorption due to x rays, β^+ or both
R.M. Diamond, Phys. Rev. 89, 1149 (1953).

Nb⁹⁵
41 54 τ_1 84^h d 65^dZr chem
 γ 0.231 s ce^-
90^h

H. Siätis, L. Zappa, Arkiv Fysik 6, 81 (1953).

β^- 0.159 d 65^dZr chem
 γ 0.745 $\alpha = 0.0024$ s; ce^-

H. Siätis, L. Zappa, Arkiv Fysik 6, 81 (1953).

β^- 0.171 sl
 γ 0.771 $\alpha = 0.0018$ K/LM = 2.4^{*}

E.F. Strucken, A.H. Weber, BAPS 28, 3, U11 (1953); *verbal report.

γ 0.774 K/LM = 6.6 s ce^-
R.E. Maerker, R.D. Birkhoff, Phys. Rev. 89, 1159 (1953).

γ 0.76 d 65^dZr chem; scin
(β) (0.76 γ) indicates $\gamma/\beta \sim 1$

C.E. Mandeville, E. Shapiro, R.I. Mendenhall, E.R. Zucker, G.L. Conklin, Phys. Rev. 89, 559 (1953).

γ 0.764 s ce^-
P.S. Mittelman, BAPS 28, 3, U10 (1953).

Mo⁹⁰
42 48 τ 5.7^h Nb⁹³ (55-Mev p) chem
 β^+ $\sim 1.4?$ Al a
 γ ~ 0.12 Pb a
 ~ 0.25
1.1

*Absorption due to x rays, β^+ or both

R.M. Diamond, Phys. Rev. 89, 1149 (1953).

Mo⁹¹
42 49 τ_1 65.5^s Mo (≤ 24 -Mev γ)
75^s σ (65.5^s) / σ (15.5^m) = 0.2 for $E_\gamma = 16-20$
indicating 65.5^s state has larger spin

L. Katz, R.G. Baker, R. Montalbetti, Can. J. Phys. 31, 250 (1953).

⁹¹ Mo 42 49 75 ^s	No 65.5 ^s activity from Mo (14.4-Mev n,2n); weak activity from Mo (18-Mev n,2n) J.E.Brolley, Jr., Phys. Rev. 89, 877(1953); 88, 618(1952).			¹⁰⁶ Rh 45 61	γ 100 \dagger 0.51 53 \dagger 0.62 2 \dagger 0.87 7 \dagger 1.04 1 \dagger 1.55 (0.62 γ) (0.51 γ) (θ) and polarization- direction I = 0+, 2+, 0+ $\gamma\gamma(\theta)$ coefficients 12% lower than theory J.J.Kraushaar, M.Goldhaber, Phys. Rev. 89, 1081 (1953).	scin	
16 ^m	τ_{2+} 15.5 ^m β^+ 3.3	Mo (\leq 24-Mev γ) a	65.5 ^s level 0.15 ± 0.05 Mev above 15.5 ^m g.s. from Mo(γ ,n) thresholds L.Katz, R.G.Baker, R.Montalbetti, Can. J. Phys. 31, 250(1953).				
⁹³ Mo 42 51 6.7 ^h	Mass assignment of 6.7 ^h activity confirmed with ms Nb (6.7-Mev d) chem γ 0.27 scin 0.70 1.5 R.Bernas, J.Beydon, Compt. rend. 236, 194(1953).			¹⁰⁵ Pd 46 59	I 5/2 S J.Blaize, H.Chantrel, J. phys. radium 14, 135 (1953).		
	Mass assignment of 6.7 ^h activity confirmed with ms Nb (25-Mev d) γ 0.264 K/LM=2.8 L/M \sim 3 $s\pi\sqrt{2}$ ce ⁻ 0.685 pe ⁻ 1.479 pe ⁻ D.E.Alburger, S.Thulin, Phys. Rev. 89, 1146(1953).			¹⁰⁷ Ag 47 60	$\mu(\text{Ag}^{107})/\mu(\text{Ag}^{109}) = 0.86627$ G.Wessel, H.Lew, BAPS 28, 3, Q8(1953).	M	
				¹⁰⁹ Ag 47 62	$\mu(\text{Ag}^{107})/\mu(\text{Ag}^{109}) = 0.86627$ G.Wessel, H.Lew, BAPS 28, 3, Q8(1953).	M	
				¹¹⁰ Ag 47 63 270 ^d	(0.53 β)(0.66 γ) (0.53 β)(0.89 γ) (0.53 β)(0.94 γ) No (0.53 β)(1.52 γ) No (0.53 β)(1.39 γ) (0.66 γ)(0.89 γ) (0.66 γ)(0.94 γ) (0.66 γ)(1.39 γ) (0.89 γ)(0.94 γ) (0.89 γ)(1.39 γ) (1.52 γ)(0.66 γ) (1.52 γ)(0.76 γ) No (1.52 γ)(0.89 γ) Results in agreement with Siegbahn decay scheme S.A.E.Johansson, S.Almquist, Arkiv Fysik 5, 427 (1952).		
⁹³ Tc 43 50 44 ^m	τ_1 43.5 ^m γ 0.390	Mo ⁹² (9.5-Mev p) chem $a_K = 0.31$ K/LM = 5.8 M4 $s\pi\sqrt{2}$ ce ⁻ , pe ⁻	Assignment from Nb ⁹³ (39-Mev α), Mo (\sim 0 to 20-Mev d); formerly assigned to Tc ⁹² H.T.Easterday, H.A.Medicus, Phys. Rev. 89, 752 (1953).				
⁹⁶ Tc 43 53 52 ^m	τ_1 52 ^m β^+ \sim 0.01% γ I.T. 0.034 Assignment from Mo ⁹⁶ (9.5-Mev p), Mo (4-Mev p); formerly assigned to Tc ⁹⁴ H.T.Easterday, H.A.Medicus, Phys. Rev. 89, 752 (1953).	Nb ⁹³ (13.5-Mev α) $s\pi\sqrt{2}$ ce ⁻ K/L = 1.2					
¹⁰³ Ru 44 59	γ (0.499) $\tau < 2 \times 10^{-9s}$	$\beta\gamma$	T.C.Engelder, Phys. Rev. 90, 259(1953).				
⁹⁷ Rh 45 52	τ 31 ^m β^+	Ru (28-Mev d) chem	¹¹⁷ Cd 48 69 2.8 ^h τ_1 3.0 ^h Cd(n, γ) Cd(d,p) U(n,f) β^- weak if present C.D.Coryell, P.Lévêque, H.G.Richter, Phys. Rev. 89, 903A(1953).				
	A.H.W.Aten, Jr., H.Cerfontain, W.Dzucbas, T.Hamer- ling, Physica 18, 972(1952).			$\sim 50^m$ τ_2 $\sim 50^m$ Cd(n, γ) Cd(d,p) U(n,f) β^- and γ p $\sim 2^h$ In ? C.D.Coryell, P.Lévêque, H.G.Richter, Phys. Rev. 89, 903A(1953).			
⁹⁸ Rh 45 53	τ 9 ^m β^+	Ru (28-Mev d) chem s	¹¹⁸ Cd 48 70 τ $\sim 30^m$ U(n,f) β^- a Not p 4.5 ^m In C.D.Coryell, P.Lévêque, H.G.Richter, Phys. Rev. 89, 903A(1953).				

⁴⁹₆₂ ^{In}¹¹¹ $\gamma\gamma(\theta)$ $b = -0.19$ liquid sample
 b depends on phase not chemical structure
 R.M.Steffen, Phys. Rev. 89, 903A(1953).

⁴⁹₆₄ ^{In}¹¹³ μ **5.4966** $\text{In}(\text{NO}_3)_3$; I
 $\mu(\text{In}^{113})/\mu(\text{In}^{115}) = 0.99787 \pm 0.00004$
 Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).

⁴⁹₆₅ ^{In}¹¹⁴ β^- **2.01** 50^dIn ; s
 72^s
 V.S.Shpinel, N.V.Forafontov, Zhur. Eksptl' i Teoret. Fiz. 21, 1376(1951).

⁴⁹₆₆ ^{In}¹¹⁵ μ **5.5083** $\text{In}(\text{NO}_3)_3$ ScCl_3 ; I
 $\nu(\text{In}^{115})/\nu(\text{Sc}^{45}) = 0.901877 \pm 0.00005$
 Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).

⁴⁹₆₇ ^{In}¹¹⁶ τ_1 **54.14^m \pm 0.07** $\text{In}(\text{pile n})$
 54^m Counted for 5 half-lives with G-M
 K.W.Downes, G.A.Price, R.Sher, V.J.Walsh, BNL-216 (T-33).

⁴⁹₆₈ ^{In}¹¹⁷ τ_1 **70^m** $\text{U}(\text{n}, \text{f})$
 70^m β^- and weak γ a
 C.D.Coryell, P.Lévêque, H.G.Richter, Phys. Rev. 89, 903A(1953).

$\sim 2.5^h$ τ_2 **$\sim 2.5^h$** $\text{U}(\text{n}, \text{f})$
 β^- and very weak γ a
 C.D.Coryell, P.Lévêque, H.G.Richter, Phys. Rev. 89, 903A(1953).

⁴⁹₆₉ ^{In}¹¹⁸ τ_2 **< 1^m** $\text{d } 30^m \text{Cd chem}$
 $< 1^m$ β^- **4.0** a
 C.D.Coryell, P.Lévêque, H.G.Richter, Phys. Rev. 89, 903A(1953).

τ_1 **53.99^m \pm 0.06** $\text{In}(\text{pile n})$
 Counted for 6 half-lives with β electro-scope
 E.E.Lockett, R.H.Thomas, Nuclonica 11, No. 3, 14(1953).

⁵⁰₆₃ ^{Sn}¹¹³ τ **120^d** $\text{Sn}(\text{pile n})$ chem
 112^d No 0.255 γ (<1% of 0.39 γ) scin
 No 0.401 γ (<10% of 0.39 γ)

Y.Deschamps, P.Avignon, Compt. rend. 236, 478 (1953).

No e^- (0.085 γ) <1% of e^- (0.392 γ) 81
 No e^- (0.255 γ) <1% of e^- (0.392 γ)
 e^- (0.401 γ) not resolvable
 e^-/e_{KLM}^- (0.392 γ) = 0.56
 $\epsilon/\epsilon_{\text{K}} = 0.08$ to 0.17 (if all ϵ to 0.392 level)
 Previous value of 0.8 superseded

C.D.Broyles, D.A.Thomas, S.K.Haynes, Phys. Rev. 89, 715(1953).

⁵¹₇₀ ^{Sb}¹²¹ Q **-1.3** S
 G.Sprague, D.H.Tomboulian, BAPS 28, 3, Q11(1953).

⁵¹₇₂ ^{Sb}¹²³ Q **-1.7** S
 G.Sprague, D.H.Tomboulian, BAPS 28, 3, Q11(1953).

⁵¹₇₃ ^{Sb}¹²⁴ β^- 14% **0.24** 8π
 60^d 49% **0.61**
 9% **0.966**
 7% **1.602**
 21% **2.317** F-K plot not linear
 $2.3\beta \Delta I = 1, \text{yes ?}$ Not $\Delta I = 2, \text{yes}$
0.603 $\alpha = 0.0034$ $K/LM = 7.9$ $E2$ ce^-
0.641 pe^-
0.716
1.68
2.09

(1.68 γ) (0.60 γ)^{*} (2.09 γ) (0.60 γ)^{*}

R.J.D.Moffat, N.Lazar, L.M.Langer, BAPS 28, 3, U13(1953); ^{*}verbal report.

β^- 10% **0.223** S
 53% **0.609**
 6% **0.871**
 5% **1.581**
 5% **1.658** F-K plot not linear
 21% **2.306** F-K plot not linear
 $2.3\beta \Delta I = 2, \text{no ?}$ Not $\Delta I = 2, \text{yes}$
 γ Rel. intensity of ce^-

0.604 $K:L:M = 100:13:3$

0.648 $K = 5.4$

0.711 ?

0.725 $K = 7.8$

1.697 $K = 3.4$

E.P.Tomlinson, S.L.Ridgway, K.Gopalakrishnan, BAPS 28, 3, U12(1953); verbal report.

γ **0.607** $K/LM \sim 15$ $s ce^-$

R.E.Maerker, R.D.Birkhoff, Phys. Rev. 89, 1159 (1953).

γ (0.60) $\tau < 2 \times 10^{-9}$ $\beta\gamma$

T.C.Engelder, Phys. Rev. 90, 259(1953).

γ (1.70) (E)1 99.9% $\gamma\gamma(\theta)$
 $\alpha = 2.6 \times 10^{-4}$ E1

(1.70 γ) (0.60 γ) (θ) $I = 3, 2, 0$

I (2.3 level Te^{124}) = 3-

(2.06 γ) (0.60 γ) (θ) $I = 3, 2, 0$

F.R.Metzger, Phys. Rev. 90, 328(1953).

γ (1.70) (E)1 99.9% $\gamma\gamma(\theta)$
 (1.70 γ) (0.60 γ) (θ) $I = 3, 2, 0$

J.J.Kraushaar, M.Goldhaber, Phys. Rev. 89, 1081 (1953).

⁵²₇₁ ^{Te}¹²³ γ (0.159) $\tau = 1.9 \times 10^{-10}$ $e_K^- e_K^-$
 100^d R.L.Graham, R.E.Bell, Can. J. Phys. 31, 377(1953).

⁵²₇₃ ^{Te}¹²⁵ γ (0.035) $\tau = 1.6 \times 10^{-9}$ $e_L^- e_L^-$
 58^d R.L.Graham, R.E.Bell, Can. J. Phys. 31, 377(1953).

$^{125}_{52}\text{Te}$	γ	0.0355	$\alpha_K = 160$	pc
			K: L: M = 5.4: 3.6: 1.0	
		0.110	$\alpha_K = 11$	
			K: L: M = 40: 5.5: 1.0	

J.G. Balfour, quoted by S.C. Curran, Physica 18, 1161 (1952).

$^{126}_{53}\text{Te}$	β^-	72.5 \dagger	0.87	I(28-Mev d); sl
		27.5 \dagger	1.26	
	β^+	2.7 \dagger	1.21	
	γ			sl ce $^-$ pe $^-$ scin
		0.390	$\alpha_K = 0.016$	K/LM ≥ 8 E2
		0.67		

$\epsilon_K / (0.67\gamma) \sim 1.25^*$ (0.39 γ) / (0.67 γ) ~ 1.0
 ($\sim 0.9\beta^-$) (0.39 γ) (K x ray) (0.67 γ)

*From comparison with Cs 137 K x ray/ γ value

N. Marty, H. Langevin, P. Hubert, Compt. rend 236, 1153 (1953).

$^{127}_{53}\text{Te}$	q	0.69	solid I $_2$ Mic
			T. Kamel, J. Phys. Soc. Japan 7, 649 (1952).

$^{131}_{53}\text{Te}$	τ	8.05 $^d \pm 0.01$	U(n,f)
			R.M. Bartholomew, E. Brown, R.C. Hawkins, W.F. Merritt, L. Yaffe, Can. J. Chem. 31, 120 (1953).

τ 8.06 $^d \pm 0.02$

E.E. Lockett, R.H. Thomas, Nucleonics 11, No. 3, 14 (1953).

γ (0.637) $\alpha_K = 0.0040$ E2 s ce $^-$ pe $^-$
 (0.722) $\alpha_K = 0.0031$ E2

J.L. Wolfson, Can. J. Phys. 30, 715 (1952).

Mass assignment of 54 m activity confirmed from U(n,f) cumulative yield of 7.7%
 (Xe 132 yield = 4.2%, Xe 134 yield = 8.2%; ms)

L. Yaffe, A.E. Day, B.A. Greer, Can. J. Chem. 31, 48 (1953).

Xe	Neutron resonances (ev)	$E_n = 1.5$ ev to 2 kev
	9.3	
	13.9	$\sigma_0 \Gamma^2 \sim 1000$
		S.P. Harris, Phys. Rev. 89, 904A (1953).

$^{133}_{54}\text{Xe}$	γ	(0.08)	$\alpha_K = 1.8$ K/LM = 6 M1
			$\tau = 6 \times 10^{-9}$ s $\beta^- e_K^-$
			R.L. Graham, R.E. Bell, Can. J. Phys. 31, 377 (1953).

$^{135}_{54}\text{Xe}$	τ	9.13 h	U(n,f) chem
			F. Brown, L. Yaffe, Can. J. Chem. 31, 242 (1953).

γ (0.25) $\tau = 2.8 \times 10^{-10}$ s $\beta^- e_K^-$
 K/LM = 5.6

R.L. Graham, R.E. Bell, Can. J. Phys. 31, 377 (1953).

$^{145}_{54}\text{Xe}$	Existence of 0.8 s Xe activity in doubt previously reported as p 1.8 h Ce 149 , q.v.
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A.A. Caretto, Jr., S. Katcoff, Phys. Rev. 89, 1267 (1953).

$^{134}_{55}\text{Cs}$	γ	0.202	0.663 s pe $^-$ ce $^-$
$^{134}_{55}\text{Cs}$	γ	0.475	0.797 K/L = 7.3
$^{134}_{55}\text{Cs}$	γ	0.563	0.803
		0.570	1.039
		0.605 K/L = 6.4	1.168
			1.368

J.W. LeBlanc, W.H. Nester, D.W. Martin, M.K. Brice, J.M. Cork, Phys. Rev. 89, 907A (1953).

γ 0.602 K/LM = 6.6 s ce $^-$
 0.799 K/LM = 7.8

R.E. Maerker, R.D. Birkhoff, Phys. Rev. 89, 1159 (1953).

$^{137}_{55}\text{Cs}$	τ	33 v	U(n,f) chem ms
			Calc. from Cs 137 /Cs 133 ratios measured between 4.2 and 5.4 years after fission

D.R. Wiles, B.W. Smith, R. Horsley, H.G. Thode, Can. J. Phys. 31, 419 (1953).

β^- 0.512 $\Delta I = 2$, yes shape sl
 1.20 $\Delta I = 2$, no

C.D. Broyles, D.A. Thomas, S.K. Haynes, Phys. Rev. 89, 715 (1953).

γ 0.663 K/LM = 4.62 s ce $^-$

R.E. Maerker, R.D. Birkhoff, Phys. Rev. 89, 1159 (1953).

$^{138}_{55}\text{Cs}$	τ	32 m	U(n,f) chem
$^{138}_{55}\text{Cs}$	β^-	3.40	F-K plot not linear sl
	γ	33 †	sl ce, scin
		43 †	scin
		100 †	scin
		1.44	
		($\sim 3\beta^-$) X 1.44 γ ?	

(1.44 γ)(0.46 γ ?) (1.44 γ)(0.98 γ ?)

L.M. Langer, R.B. Duffield, C.W. Stanley, Phys. Rev. 89, 907A (1953).

$^{133}_{56}\text{Ba}$	γ	(0.012) $\tau < 0.02$ $^{\mu}$ s
		M. Langevin, Compt. rend 236, 689 (1953).

$^{140}_{56}\text{Ba}$	γ	0.540	K/LM ~ 6 s ce $^-$
			R.E. Maerker, R.D. Birkhoff, Phys. Rev. 89, 1159 (1953).

$^{140}_{57}\text{La}$	τ	40.2 h	La (pile n)
			R.M. Bartholomew, F. Brown, R.C. Hawkins, W.F. Merritt, L. Yaffe, Can. J. Chem. 31, 120 (1953).

γ 0.488 K/LM = 3.7 s ce $^-$
 R.E. Maerker, R.D. Birkhoff, Phys. Rev. 89, 1159 (1953).

Ce No fission product Ce with $6^m < \tau < 13.9^m$ chem
 A.A. Caretto, Jr., S. Katcoff, Phys. Rev. 89, 1267 (1953).

$^{141}_{58}\text{Ce}$	γ	(0.145) $\tau < 2 \times 10^{-9}$ s	$\beta\gamma$
			T.C. Engelder, Phys. Rev. 90, 259 (1953).

⁵⁸Ce¹⁴⁵₈₇ No 1.8^hCe activity U(n,f) chem
Previously reported activity due
to 2.0^hNd impurity?
A.A.Caretto, Jr., S.Katcoff, Phys. Rev. 89, 1267
(1953).

⁵⁸Ce¹⁴⁶₈₈ τ 13.9^m d 24.4^mPr U(n,f) chem
 β^- ~0.9 a
 γ ~0.2 a
A.A.Caretto, Jr., S.Katcoff, Phys. Rev. 89, 1267
(1953).

⁵⁹Pr¹⁴¹₈₂ μ 3.8 M
H.Lew, Phys. Rev. 89, 530(1953).

μ +3.9 S
Calculated from data of White, Phys. Rev.
34, 1397(1929)
P.Brix, Phys. Rev. 89, 1245(1953).

⁵⁹Pr¹⁴⁴₈₅ γ (0.895) $\tau < 2 \times 10^{-9}$ s $\beta\gamma$
T.C.Engelder, Phys. Rev. 90, 259(1953).

⁵⁹Pr¹⁴⁵₈₆ No 4.5^hPr activity U(n,f) chem
Previously reported activity due
to 3.7^hLa impurity?
A.A.Caretto, Jr., S.Katcoff, Phys. Rev. 89, 1267
(1953).

⁵⁹Pr¹⁴⁶₈₇ τ 24.4^m d 13.9^mCe U(n,f) chem
 β^- 3.8 a
A.A.Caretto, Jr., S.Katcoff, Phys. Rev. 89, 1267
(1953).

⁶⁰Nd¹⁴⁷₈₇ γ (0.092) $\tau = 2.44 \times 10^{-9}$ s
 $\alpha_K = 1.8$ K; L: M = 29:4:1
R.L.Graham, R.E.Bell, Can. J. Phys. 31, 377(1953).

Sm Neutron resonances (ev)* $E_n = 0.1$ ev to 40ev
3.43** 19
12 ? 22
15.2

*Isotopic assignment uncertain

**Not Sm 149, 152, or 154

V.L.Sailor, M.L.Foote, Jr., H.H.Landon, Phys.
Rev. 89, 904A(1953); priv. comm.

⁶²Sm¹⁴⁹₈₇ Neutron resonances (ev) $E_n = 0.1$ ev to 40ev
0.094
0.87
4.95

V.L.Sailor, M.L.Foote, Jr., H.H.Landon, Phys.
Rev. 89, 904A(1953); priv. comm.

⁶²Sm¹⁵²₉₀ Neutron resonance (ev) $E_n = 0.1$ ev to 40ev
8.20

V.L.Sailor, M.L.Foote, Jr., H.H.Landon, Phys.
Rev. 89, 904A(1953); priv. comm.

⁶³Eu¹⁵²₈₉ τ 12.4^y ± 0.4 Eu(pile n)
Counted for 1.1 years with β electroscopie
E.E.Lockett, R.H.Thomas, Nucleonics 11, No. 3,
14(1953).

τ 15.6^y ± 1.5 Eu(pile n)
Counted for 200 days with ic
J.Kastner, Can. J. Phys. 31, 169(1953).

⁶³Eu^{152, 154}₈₉ γ 1.40 $s\pi pe^-$
L.Y.Shavtvalov, Zhur. Eksptl' i Teoret. Fiz.
23, 611(1952).

⁶⁴Gd¹⁴⁸? τ $> 35^y$ Sm¹⁴⁷ (32-Mev d) Eu(32-Mev d);
 α $> 25\%$ 3.2 ion chem yield; ic
No 7^h activity found Sm(30-Mev α) ion chem
(7.5^hAt from Bi impurity?)
*Assuming $\sigma(36\text{-Mev } \alpha, 3n) = 1$

J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

⁶⁴Gd¹⁴⁹₈₄ ϵ Sm¹⁴⁷ (31-Mev α) not Sm(19-Mev d),
 $\alpha \sim 0.0007\%$ 3.0 ion chem; ic
J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

⁶⁴Gd¹⁵⁰? α 2.7 Eu(19-Mev d) chem; ic
J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

⁶⁵Tb¹⁴⁹₈₄ τ 4.1^h Eu(80-Mev α)
 ϵ ? Gd(31-Mev p); ion chem
 α 3.95
No β^+

J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

⁶⁵Tb¹⁵¹? τ 19^h Gd(100-Mev p) Eu(45-Mev α)
 $\alpha > 0.0004\%$ 3.4 ion chem; ic
J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953); *M.A.Rollier, J.O.Ras-
mussen, ibid.

⁶⁶Dy^{149, 153} τ 19^m Tb(100-Mev p)
 α 4.1 not Eu(120-Mev α); ic
 τ 2.3^h Tb(100-Mev p); ion chem
 α 3.6 Nd(~ 100 -Mev C^{12}); ic
 τ 7^m Tb(100-Mev p)
 α 4.2 Nd(~ 100 -Mev C^{12}); ic
Not Eu(120-Mev α)

J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

Ho? τ $\sim 4^m$ Dy(200-Mev p)
 α 4.2 Sm(100-Mev C^{12})? ic
No Ho α activity observed with $\tau > 1^h$
Er(200-Mev p) Yb(250-Mev p); ion chem

J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

Er

No Er α activity observed with $\tau > 1^h$
Er(200-Mev p) Yb(250-Mev p); ion chem
J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

Tm

No Tm α activity observed with $\tau > 1^h$
Er(200-Mev p) Yb(250-Mev p); ion chem
J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso,
Phys. Rev. 89, 33(1953).

Yb

Neutron resonances (ev) $E_n = 0.1$ ev to 40 ev
0.597 13.3
4.55 18.2
8.09 30
V.L.Sallor, H.L.Foote, Jr., H.H.Landon, Phys.
Rev. 89, 904A(1953).

Lu¹⁷⁶

τ_{β^-} $2.0 \times 10^{10} y$ 92 β 's/sec/g Lu*
71 105 200 γ 's/sec/g Lu
 β^- ~ 0.4 a
 γ 100 \dagger 0.20 scin
100 \dagger 0.32
(0.32 γ) (0.20 γ) (0.4 β) (γ)
No 0.52 γ (<10%) 0.090 γ not observed
x ray/disintegration ~ 0.35
accounted for by γ conversion
J.R.Arnold, T.Sugihara, Phys. Rev. 90, 332(1953);
*A.D.Suttile, Jr., *ibid.*

Lu¹⁷⁷

(0.206 γ) (0.112 γ) $b = -0.20$
71 106 $I = 5/2, 7/2, 3/2$ (E) 1, (E) 2
T.Wiedling, Arkiv Fysik 6, 39(1953).

Hf¹⁸¹

γ (0.48) $\tau = 1.04 \times 10^{-8} s$ (ce $^-$) (γ)
72 109 T.C.Engelder, Phys. Rev. 90, 259(1953).

γ (0.34) } $\tau = 1.06 \times 10^{-8} s$ $\gamma\gamma$
(0.48) }
H. deWaard, Physica 18, 1151(1952).
 $\sim 10^{14} s$ level produced by Ta(γ, γ') $E_\gamma \leq 6.5$ scin
H.N.Brown, R.A.Becker, Phys. Rev. 90, 328(1953).

W¹⁸⁵

γ (0.13) $\tau < 2 \times 10^{-9} s$ $\beta\gamma$
74 111 T.C.Engelder, Phys. Rev. 90, 259(1953).

W¹⁸⁷

τ 23.85 h W(slow n)
74 113 G.G.Eichholz, Phys. Rev. 89, 525(1953).

τ 24.0 h W¹⁸⁶ (pile n, γ)
 β^- * 80% 0.622 $8\pi \times 2$
20% 1.304

W¹⁸⁷

γ

74 113

0.072

0.106

0.114

0.134

0.206

0.239

0.246

0.480

K/L

5.5

4.2

K/L

$L_I/L_{III} \sim 80$ for 0.134 γ

J.M.Cork, M.K.Brice, W.H.Nester, J.M.LeBlanc,
D.W.Martin, Phys. Rev. 89, 1291(1953); *A.E.
Stoddard, *ibid.*

Re¹⁸⁵

75 110

I

5/2

Mic

$q(\text{Re}^{185})/q(\text{Re}^{187}) = 1.06$

A.Javan, G.Silvey, C.H.Townes, A.V.Grosse, BAPS
28, 2, J8(1953).

Re¹⁸⁷

75 112

I

5/2

Mic

$q(\text{Re}^{185})/q(\text{Re}^{187}) = 1.06$

A.Javan, G.Silvey, C.H.Townes, A.V.Grosse, BAPS
28, 2, J8(1953).

β^-

~ 0.034

dpl

B.Gauthe, J.M.Blum, Compt. rend. 236, 1255(1953).

β^-

$\sim 0.40^*$

3 d forbidden?

pc

No x ray or γ
Spectral shape similar to Rb⁸⁷
 β counts less than background
D.Dixon, McNair, quoted by S.C.Curran, Physica
18, 1161(1952); Nature 170, 512(1952).
*Decimal point as assigned in these references.

Re¹⁸⁸

75 113

τ_1

18.7 m

Re(slow n)

γ

0.06

$\alpha \sim 2$

a

D 18 h Re m

Szilard-Chalmers chem

A.Flammersfeld, Z. Naturf. 8a, 217(1953); *W.Herr,
Z. Naturf. 7a, 819(1952).

τ_1

22 m

Re¹⁸⁷ (pile n)

γ

0.0635

s ce $^-$

0.105

$\gamma\gamma$ (Re x ray + 0.06 γ)/(0.106 γ) ≥ 10 scin

J.W.Mihelich, Phys. Rev. 89, 907A(1953).

18 h

γ

0.153

0.485

0.645

1.4

sl

(0.65 γ) (1.4 γ)
C.C.Mullen, H.E.Petch, M.W.Johns, Proc. Roy. Soc.
Canada 44, 194A(1950).

¹⁸⁵ ₇₆ Os	γ	0.163		s ce ⁻
109		0.234		
		0.645	K/L~8	
		0.879		

J.M.Cork, J.M.LeBlanc, W.H.Nester, D.W.Martin, M.K.Brice, Phys. Rev. 90, 444(1953).

¹⁹³ ₇₆ Os	γ	0.073	L _I /L _{II} ~1	0.404	s ce ⁻
117		0.106	L/M~3	0.460	
		0.139	K/L~5	0.558	
		0.251			
		0.281	K/L~10		
		0.321	K/L~8		

J.M.Cork, J.M.LeBlanc, W.H.Nester, D.W.Martin, M.K.Brice, Phys. Rev. 90, 444(1953).

¹⁹² ₇₇ Ir	β^-	16%	0.24		s
115		40%	0.54		
70 ^d		44%	0.67		
	No 0.84 β^- (<0.4%)				
	γ		$\frac{K^*}{L^*}$	$\frac{M^*}{L^*}$	
		0.137	~1.8		
		0.202	~0.65		
		0.207	4.3	4.0	1.2
		0.296	16	7.4	
		0.309	15	6.7	
		0.317	34	18	5.5
		0.401	~0.1		
		0.420	~0.1		
		0.440	~0.05		
		0.468	7.7	2.2	0.64
		0.488	0.50		
		0.590	0.45	0.07	
		0.605	1.4	0.25	
		0.613	0.56	0.10	
		0.880	4.4**	1.1**	~0.5**

* (ce⁻/β) x 10⁻³ ** (ce⁻/β) x 10⁻⁶

A.A.Bashilov, N.M.Anton'eva, B.S.Dzhelepov, Izvest. Akad. Nauk Ser. Fiz. SSSR 16, 264(1952).

¹⁹⁴ ₇₇ Ir	γ	100†	0.33		scin
117		100†	1.48	(E)2 98% (M)1 2%	
		1†	{1.8 2.1		
	(1.48γ) (0.33γ) (θ)			I = 2, 2, 0	

J.J.Kraushaar, M.Goldhaber, Phys. Rev. 89, 1081 (1953).

¹⁹¹ ₇₈ Pt	τ	3.2 ^d		Ir(10-Mev d) chem, not Pt (≤22-Mev γ)	
113	γ	0.062	0.129	0.350	8π Ce ⁻
		0.082	0.171	0.359	
		0.094	0.178	0.408	
		0.125	0.267	0.455	
	No 0.042γ			0.537	

J.B.Swan, W.M.Portnoy, R.D.Hill, Phys. Rev. 89, 907A; 90, 257(1953).

¹⁹³ ₇₈ Pt	τ_1	4.5 ^d		Ir(10-Mev d) chem Pt (≤22-Mev γ)	
115	γ IT	0.135	M4		8π
4.3 ^d				K: L _I : L _{III} : M: N = 10: 12: 24: 13: 6	

J.B.Swan, W.M.Portnoy, R.D.Hill, Phys. Rev. 89, 907A; 90, 257(1953).

¹⁹³ ₇₈ Pt	τ_2	>74 ^d or <1 ^h			
115					
g.s.					
					Measurements outside these limits obscured by 72 ^d Ir and 80 ^m Pt
					J.B.Swan, W.M.Portnoy, R.D.Hill, Phys. Rev. 90, 257(1953).

¹⁸³ ₇₉ Au	τ	4.3 ^m		Pt(120-Mev p); chem	
187	α	5.1			1c

J.O.Rasmussen, Jr., S.G.Thompson, A.Ghiorso, Phys. Rev. 89, 33(1953).

¹⁹⁵ ₇₉ Au	γ	0.057		d 38 ^h Hg; 8π√2	
116		0.262			
30 ^s					

K.Gopalakrishnan, A.de-Shalit, J.W.Mihelich, Phys. Rev. 89, 908A(1953).

¹⁹⁶ ₇₉ Au	γ	(0.33)	(E)2 95%	(M)1 5%	γγ(θ)
117		(0.36)	(E)2		γγ(θ)
5.6 ^d					
	γγ(θ)	I = 2, 2, 0			
	No crossover γ (<1%)				scin
	γγ(θ) independent of phase and chemical structure				

R.W.Steffen, Phys. Rev. 89, 665(1953); 89, 903A(1953).

¹⁹⁸ ₇₉ Au	τ	2.697 ^d ± 0.003		Au(pile n) β electroscopie	
119					
	Counted for 10 days				
					E.E.Lockett, R.H.Thomas, Nucleonics 11, No. 3, 14(1953).

γ	(0.68)	(E)2 60%	(M)1 40%	γγ(θ)	
	(0.68γ) (0.41γ) (θ)			I = 2, 2, 0	

C.D.Schrader, E.B.Nelson, J.A.Jacobs, Phys. Rev. 90, 159(1953).

No ϵ_K (<0.5%)					sl
					from absence of Pt Auger e ⁻

C.D.Broyles, D.A.Thomas, S.K.Haynes, Phys. Rev. 89, 715(1953).

¹⁹³ ₈₀ Hg	γ	0.039		Au(p)chem; 8π√2 ce ⁻ (Hg)	
113		0.102			
10 ^h		0.032		8π√2 ce ⁻ (Au)	
		0.120			
		0.258			

K.Gopalakrishnan, A.de-Shalit, J.W.Mihelich, Phys. Rev. 89, 908A(1953).

¹⁹³ ₈₀ Hg	τ_2	27 ^h		Au(p) chem	
115					
38 ^h					

K.Gopalakrishnan, A.de-Shalit, J.W.Mihelich, Phys. Rev. 89, 908A(1953).

¹⁹⁵ ₈₀ Hg	γ	0.037		Au(p) chem; 8π√2 ce ⁻	
115		0.123			
38 ^h					

K.Gopalakrishnan, A.de-Shalit, J.W.Mihelich, Phys. Rev. 89, 908A(1953).

²⁰³ ₈₀ Hg	γ	(0.28)		$\tau < 2 \times 10^{-9}$ ^s	by
123					
					T.C.Engelder, Phys. Rev. 90, 259(1953).

Tl²⁰⁴ τ **2.71^y ± 0.05** Tl(pile n)
 81 123 Counted for 8 months β electroscopie
 E.E.Lockett, R.H.Thomas, Nucleonics 11, No. 3,
 14(1953).

Tl²⁰⁶ τ **4.19^m ± 0.02** Tl(pile n)
 81 125 Counted for 25 half-lives β electroscopie
 B.W.Sargent, L.Yaffe, A.P.Gray, Can. J. Phys.
 31, 235(1953).

Tl²⁰⁷ τ **4.79^m ± 0.02** Bi²¹¹ recoil
 81 126 Counted for 25 half-lives β electroscopie
 B.W.Sargent, L.Yaffe, A.P.Gray, Can. J. Phys.
 31, 235(1953).

Tl²⁰⁸ (0.58 γ) (2.62 γ) polarization-direction
 81 127 I = 4⁺, 2⁺, 0⁺
 J.J.Kraushaar, M.Goldhaber, Phys. Rev. 89, 1081
 (1953).

Pb²⁰⁰ γ **0.139** Tl(80-Mev d) chem
 82 118 **0.320** $\pi\pi^+ 2\text{ ce}^-$
 G.D.O'Kelley, UCRL-1243(1951).

Pb²⁰³ γ **0.153** Tl(80-Mev d) chem
 82 121 **0.269** K/L = 2.3 $\pi\pi^+ 2\text{ ce}^-$
0.424
 G.D.O'Kelley, UCRL-1243(1951).

Pb²⁰⁵ Levels Pb²⁰⁶ (d,t) E_d = 14 a pc
 82 123 **0.3**
0.8
1.8
 J.A.Harvey, Can. J. Phys. 31, 278(1953).

Pb²⁰⁶ Levels Pb²⁰⁷ (d,t) E_d = 14 a pc
 82 124 **0.9** **2.2**
1.4 **3.0**
1.7
 J.A.Harvey, Can. J. Phys. 31, 278(1953).

Pb²⁰⁷ Levels Pb²⁰⁶ (d,p) Pb²⁰⁸ (d,t)
 82 125 **0.6** **0.6**
1.0 **1.0**
2.8 **1.6**
3.6 **2.3**
4.4
4.7
5.3 E_d = 14 a pc
 J.A.Harvey, Can. J. Phys. 31, 278(1953).

Pb²⁰⁸ Levels Pb²⁰⁷ (d,p) E_d = 14 a pc
 82 126 **3.4** **5.4**
3.6 **6.1**
5.1
 J.A.Harvey, Can. J. Phys. 31, 278(1953).

Pb²⁰⁹ Levels Pb²⁰⁸ (d,p) E_d = 14 a pc
 82 127 **0.8** **2.0**
1.6 **2.5**
 J.A.Harvey, Can. J. Phys. 31, 278(1953).

Pb²¹⁰ β^- **0.015** pc
 82 128 No 0.0078 γ (Cu x ray ?)
 A.A.Jaffe, S.G.Cohen, Phys. Rev. 89, 454(1953).

β^- **0.024** pc
 F-K plot linear to 8.5 kev
 E.Huster, Naturwiss. 40, 197(1953).

γ (0.047) L: M: N = 100: 23: 6 EA
 ce⁻ **0.0110** not assigned
 No ce⁻ (0.014-0.030) < 1% of ce⁻ (0.0467 γ)
 Y.Kobayashi, G.Miyamoto, J. Phys. Soc. Japan 8,
 135(1953); 273(1953).

(L x ray) / (0.047 γ) = 6.3 pc
 Peaks seen ascribed to nuclear γ 's of
 16.1, 24, 30.7, 37.0, 41.5, 62.5 kev
 P.E.Damon, R.R.Edwards, Phys. Rev. 90, 280(1953).

Pb²¹² γ **0.23863** s
 82 130 H α (F) = 1388.56 ± 0.21
 H determined (2-20 kev) with e⁻ accelerated
 through known potential.
 D.I.Meyer, F.H.Schmidt, Phys. Rev. 89, 908A
 (1953).

γ (0.238) $\tau < 2 \times 10^{-11}$ s βe_K^-
 R.L.Graham, R.E.Bell, Can. J. Phys. 31, 377(1953).

Pb²¹⁴ β^- **0.35 ?** s βe^-
 82 132 **33[†]** **0.67**
100[†] **~0.73**
 γ **4.3*** **0.241** s ce⁻
4.8* **0.294**
3.5* **0.350**
 [0.67 β] [e_K(0.35 γ)]
 [0.73 β] [e_K(0.29 γ)]
 *ce⁻ per 100 β^-
 E.E.Berlovich, Izvest. Akad. Nauk Ser. Fiz. SSSR
 16, 314(1952).

Bi²⁰⁸ Bi(d,t) E_d = 14 a pc
 83 125 Q values **-1.17**
-1.8
-2.2
 J.A.Harvey, Can. J. Phys. 31, 278(1953).

Bi²⁰⁹ μ **4.0400** Bi(NO₃)₃ · D₂O; I
 83 126 $\nu(\text{Bi}^{209})/\nu(\text{D}) = 1.04684 \pm 0.00005$
 Y.Ting, D.Williams, Phys. Rev. 89, 595(1953).

Rn²²¹ τ **25^m** Th(110-Mev p)
 86 135 β^- ~80%
 α ~20%

F.F.Momyer, UCRL-2060 (1953).

Rn²²² α **5.482** s
 86 136
 G.Bastin-Scoffier, J.Sant'ana-Dionisio, Compt. rend. 236, 1016 (1953).

Fr²¹² α 24% **6.339** s
 87 125 39% **6.387**
 37% **6.409**

E.K.Hyde, F.Asaro, quoted by F.F.Momyer, UCRL-2060 (1953).

Fr²²³ α/β^- ~4 x 10⁻⁵
 87 136
 E.K.Hyde, A.Ghiorso, Phys. Rev. 90, 267 (1953).

Ra²¹³ τ **2.7^m** p **^{30m}Rn²⁰⁹** Pb(C¹²)
 88 125 α **6.90** ic
 F.F.Momyer, UCRL-2060 (1953).

Ra²²⁴ α **5.679** s
 88 136
 G.Bastin-Scoffier, J.Sant'ana-Dionisio, Compt. rend. 236, 1016 (1953).

Ra²²⁶ α **4.777 ± 0.004** s
 88 138 Based on E_α (Po) = 5.299
 G.Bastin-Scoffier, J.Sant'ana-Dionisio, Compt. rend. 236, 1016 (1953).

Ac²²⁸ β^- **2.18** s $\pi\downarrow 2$
 89 139 γ **0.0568** $\tau > 0.01^s$
 $E_{d1s} = 2.24$
 At least 6 lower energy β spectra observed

J.Kyles, C.G.Campbell, W. J. Henderson, quoted by N.Feather, Physica 18, 1241 (1952).

Th²²⁸ (α) (0.083 γ) (θ) does not agree with I = 0, I, 0
 90 138 τ (0.083 γ) < 10⁻⁸ s Source Th(OH)₄
 No (0.0868 γ) (α) No $\gamma\gamma$
 J.Batley, L.Madansky, F.Rasetti, Phys. Rev. 89, 182 (1953).

Pa²³¹ γ **0.0273** $\alpha < 10$ E1 a
 91 140 **0.0336** ce⁻, ppl
0.0380
0.0569 } $L_I + L_{II} \approx L_{III}$ E2
0.0635
0.0823 $L_I \approx M_I$
 Rel. intensity of ce⁻
0.102 $L_{II} : L_{III} : M = 2 : 2 : 2$
0.198 K : L = 2 : 5
0.259 K : L = 10 : 5
0.301 K : L : M = 100 : 20 : 7
 $\alpha_K \sim 1.6$ M1
0.331 K : L : M = 50 : 10 : 1
 $\alpha_K \sim 1.6$ M1

Pa²³¹ **0.357** K : L = 10 : 2
 91 140 **0.383** K = 5
 Unassigned ce⁻ 0.125, 0.135, 0.170

P.Falk-Vairant, M.Riou, J. Phys. Radium 14, 65 (1953); P. Falk-Vairant, Compt. rend. 235, 796 (1952).

U Neutron resonances (ev) $E_n = 3.7$ to 800 ev
 6.6 $\sigma_0 = 5000$ $\Gamma = 0.05$
 20 $\sigma_0 \Gamma^2 = 4.5$
 38 $\sigma_0 \Gamma^2 = 6.5$

E.Hellstrand, R.Persson, Arkiv Fysik 6, 57 (1953).

U²³⁷ τ **6.75^d** U²³⁶ (pile n) chem
 92 145 β^- < 20% (0.080) sl, scin $\beta\gamma$
 > 80% **0.25**
 γ **0.027**
0.043 sl ce⁻
 37[†] **0.059**
0.165 K/L₁ < 0.2
 21[†] **0.207** K/L₁ = 4.8
0.269
 2.5[†] **0.334**
0.370
0.430

(0.21 γ)(0.027 γ) (0.21 γ)(0.06 γ) (0.21 γ)(0.17 γ)
 (0.25 β)(0.21 γ)

No (0.33 γ) (γ) No 0.51 β (< 0.1%)

No photon with $E_\gamma > 0.34$ (< 10% of 0.33 γ)

F.Wagner, Jr., M.S.Freedman, D.W.Engelkemeir, J.R.Huizenga, Phys. Rev. 89, 502 (1953).

Np²³⁴ γ **0.177** U²³⁵ (14-Mev d) chem
 93 141 **0.442** s $\pi\downarrow 2$ ce⁻
0.803
1.42

G.D.O'Kelley, UCRL-1243 (1951).

Pu²³⁸ τ **89.6^y**
 94 144
 A.H.Jaffey, J.Lerner, ANL-4411 (1950).

γ **0.0451** s $\pi\downarrow 2$ ce⁻
 vw **0.048 ?**

Pu from long n irradiation of Am²⁴¹

G.D.O'Kelley, UCRL-1243 (1951).

Pu²⁴¹ τ_{β^-} **13.0^y**
 94 147 From Am²⁴¹ present 2.39 years after initial purification

D.R.MacKenzie, M.Lounsbury, A.W.Boyd, Phys. Rev. 90, 327 (1953).

Pu²⁴³ τ **4.98^h** Pu²⁴² (pile n) ion chem
 94 149 β^- 12% (~0.37)
 35% **0.468** scin
 53% **0.57**
 γ **0.085** $\alpha_L \leq 0.7$ scin
 ~0.1 $\alpha_L > 10$
 (0.47 β)(0.085 γ) (0.085 γ)(~0.1 γ) (0.085 γ)(Lx rays)
 No (0.57 β^-) (0.085 γ) No (0.57 β^-) (Lx rays)
 D.W.Engelkemeir, P.R.Fields, J.R.Huizenga, Phys. Rev. 90, 61 (1953).

Am²⁴¹
95 146 I 5/2 S
Large q indicated
M.Fred, F.S.Thomkins, Phys. Rev. 89, 318(1953).

γ 0.059 $\sigma \sqrt{2} \text{ ce}^-$
[$e^-(0.059\gamma)$]/ $\alpha = 0.28$

G.D.O'Kelley, UCRL-1243(1951).

No 0.0334 γ , 0.0380 γ (<0.1% of 0.059 γ) pc
Suggest lines seen* at 0.014, 0.019, 0.022
due to Am x rays, those at 0.033, 0.038 to
La x rays

J.O.Newton, B.Rose, Phys. Rev. 89, 1157(1953).
*C.I.Browne, UCRL-1764(1952); F.Asaro, et al.,
Phys. Rev. 87, 277(1952).

Am²⁴²
95 147 β^- 70% 0.628 $\sigma \sqrt{2}$
16^h ϵ 15% Am²⁴¹(pile n) chem
 γ I.T. 15% 0.035 $\alpha = 0.25$ $\sigma \sqrt{2} \text{ Am ce}^-$
0.038 $\alpha = 0.25$ Pu ce⁻
0.053 $\alpha = 0.67$ Cm ce⁻

L_{III}/L_{II} x ray ratios: $\frac{Am}{4.9}$ $\frac{Pu}{1.3}$ $\frac{Cm}{1.0}$ cryst

No γ with $E_\gamma > 0.06$ a

G.D.O'Kelley, UCRL-1243(1951).

100^y β^- 0.593 Am²⁴¹(pile n) chem
 γ 0.038 $\sigma \sqrt{2} \text{ Pu ce}^-$
0.053 Cm ce⁻

G.D.O'Kelley, UCRL-1243(1951).

Cm²⁴²
96 146 γ 0.043 $\alpha_L = 0.8$ $\sigma \sqrt{2} \text{ ce}^-$
G.D.O'Kelley, UCRL-1243(1951).

NEUTRON CROSS SECTIONS

Neutron Cross Sections

Reaction	σ Type	Value	Energy	Ref.
H(n)	σ_t	2.525	2.532	53f2
	σ_t	graph	3-13	53n1
	σ_t	1.690	4.75	53h3
	σ_t	0.057	128	53t2
Be(n)	σ_t	6.04	1ev-5kev	52h5
	σ_t	graph	3-13	53n1
C(n)	σ_t	graph	3-13	53n1
	σ_t	graph	30-139	53t2
N(n)	σ_t	graph	1.7-4	52j2
N ¹⁴ (n,2n)	$\sigma(10^mN)$	5.7 mb	14.5	53p1
O(n)	σ_{el}	0.7	14.1	53c3
O(n,<14.in)	σ_{in}	0.5	14.1	53c3
O(n)	σ_t	graph	3-13	53n1
	σ_t	1.6	14.1	53c3
O ¹⁶ (n,p)	$\sigma(7.3^mN)$	49 mb	14.5	53p1

Neutron Cross Sections - Continued

Reaction	σ Type	Value	Energy	Ref.
F ¹⁹ (n,2n)	$\sigma(1.9^hF)$	61 mb	14.5	53p1
F ¹⁹ (n,p)	$\sigma(30^sO)$	130 mb	14.5	53p1
Na(n)	σ_t	2.98	1ev-1kev	52h5
	σ_t	graph	1ev-10kev	52h5
Na ²³ (n,p)	$\sigma(40^sNe)$	34 mb	14.5	53p1
Na ²³ (n, γ)	$\sigma(15.0^hNa)$	0.53	th	53b2
Mg ²⁴ (n,p)	$\sigma(15.0^hNa)$	190 mb	14.5	53p1
Mg ²⁵ (n,p)	$\sigma(82^sNa)$	45 mb	14.5	53p1
Al(n)	σ_t	graph	3-13	53n1
	σ_t	graph	30-139	53t2
Al ²⁷ (n, α)	$\sigma(15.0^hNa)$	79 mb	14.5	53p1
Al ²⁷ (n,p)	$\sigma(9.5^mMg)$	52 mb	14.5	53p1
Si(n)	σ_t	graph	3-13	53n1
Si ²⁸ (n,p)	$\sigma(2.4^mAl)$	220 mb	14.5	53p1
Si ²⁹ (n,p)	$\sigma(8.6^mAl)$	100 mb	14.5	53p1
Si ³⁰ (n, α)	$\sigma(9.5^mMg)$	46 mb	14.5	53p1
P(n)	σ_t	2.22	14	53a1
P ³¹ (n, α)	$\sigma(2.4^mAl)$	0.15	14.5	53p1
P ³¹ (n,p)	$\sigma(2.6^hSi)$	0.064	14.5	53p1
S(n)	σ_t	graph	3-13	53n1
	σ_t	2.06	14	53a1
S ³² (n,p)	$\sigma(14.3^dP)$	0.37	14.5	53p1
S ³⁴ (n, α)	$\sigma(26^hSi)$	0.14	14.5	53p1
S ³⁴ (n,p)	$\sigma(12.4^sP)$	0.085	14.5	53p1
Cl ³⁵ (n, α)	$\sigma(14.3^dP)$	0.19	14.5	53p1
Cl ³⁵ (n,2n)	$\sigma(33^mCl)$	0.0035	14.5	53p1
Cl ³⁷ (n, α)	$\sigma(12.4^sP)$	0.052	14.5	53p1
Cl ³⁷ (n,p)	$\sigma(5.0^mS)$	0.033	14.5	53p1
K ³⁹ (n,2n)	$\sigma(7.5^mK)$	0.010	14.5	53p1
K ⁴¹ (n, α)	$\sigma(38^mCl)$	0.031	14.5	53p1
K ⁴¹ (n,p)	$\sigma(1.8^hA)$	0.081	14.5	53p1
Sc(n)	σ_a	23	th	53i1
	σ_a	25	th	52p3
Sc ⁴⁵ (n, γ)	$\sigma(85^dSc)$	22	th	53i2
Ti ⁴⁸ (n,p)	$\sigma(1.8^dSc)$	0.093	14.5	53p1
V(n)	σ_t	graph	0.02-5ev	53b4
V ⁵¹ (n, α)	$\sigma(1.8^dSc)$	0.029	14.5	53p1
V ⁵¹ (n,p)	$\sigma(8^mTi)$	0.027	14.5	53p1
Cr ⁵² (n,p)	$\sigma(3.7^mV)$	0.078	14.5	53p1
Mn ⁵⁵ (n, α)	$\sigma(3.7^mV)$	0.052	14.5	53p1
Mn ⁵⁵ (n, γ)	$\sigma(2.6^hMn)$	12.7	th	53b2
Fe(n,n')	$\sigma(\text{all } \gamma's)$	4.6	14	53a2
	$\sigma(\sim 6.5\text{MeV } \gamma's) \sim 0.5$		14	53a5
	$\sigma(\sim 2.5\text{MeV } \gamma's) \sim 2.4$		14	53a5
Fe(n)	σ_t	graph	3-13	53n1

Neutron Cross Sections - Continued

Reaction	σ Type	Value	Energy	Ref.
$\text{Fe}^{56}(\text{n}, \text{p})$	$\sigma(2.6^{\text{h}}\text{Mn})$	0.097	14.5	53p1
$\text{Fe}^{56}(\text{n}, \text{n}')$	$\sigma(0.85\gamma)$	~0.4	1.23	53r1
$\text{Co}(\text{n})$	σ_t	graph	0.1 - 3	53w2
$\text{Co}^{59}(\text{n}, \alpha)$	$\sigma(2.6^{\text{h}}\text{Mn})$	0.039	14.5	53p1
$\text{Ni}^{58}(\text{n}, 2\text{n})$	$\sigma(36^{\text{h}}\text{Ni})$	0.041	14.5	53p1
$\text{Ni}^{61}(\text{n}, \text{p})$	$\sigma(1.7^{\text{h}}\text{Co})$	0.18	14.5	53p1
$\text{Cu}(\text{n})$	σ_t	graph	3 - 13	53n1
	σ_t	3.09	14	53a1
	σ_t	table	30 - 153	53t2
	σ_t	1.19	400	53n2
$\text{Cu}^{63}(\text{n}, 2\text{n})$	$\sigma(10^{\text{h}}\text{Cu})$	0.48	14.5	53p1
	$\sigma(10^{\text{h}}\text{Cu})$	graph	13 - 27	53b6
$\text{Cu}^{65}(\text{n}, 2\text{n})$	$\sigma(12.9^{\text{h}}\text{Cu})$	1.10	14.5	53p1
$\text{Zn}^{64}(\text{n}, 2\text{n})$	$\sigma(38^{\text{h}}\text{Zn})$	0.22	14.5	53p1
$\text{Zn}^{64}(\text{n}, \text{p})$	$\sigma(12.9^{\text{h}}\text{Cu})$	0.39	14.5	53p1
$\text{Zn}^{66}(\text{n}, \text{p})$	$\sigma(5^{\text{h}}\text{Cu})$	0.10	14.5	53p1
$\text{Ga}(\text{n})$	σ_t	graph	0.1 - 3	53w2
$\text{Ga}^{69}(\text{n}, \alpha)$	$\sigma(5^{\text{h}}\text{Cu})$	0.10	14.5	53p1
$\text{Ga}^{69}(\text{n}, 2\text{n})$	$\sigma(88^{\text{h}}\text{Ga})$	0.55	14.5	53p1
$\text{Ga}^{69}(\text{n}, \text{p})$	$\sigma(14^{\text{h}}\text{Zn})$	0.024	14.5	53p1
$\text{Ga}^{71}(\text{n}, 2\text{n})$	$\sigma(20^{\text{h}}\text{Ga})$	0.70	14.5	53p1
$\text{Ge}(\text{n})$	σ_t	graph	0.4 - 3.5	52j2
$\text{Ge}^{70}(\text{n}, 2\text{n})$	$\sigma(40^{\text{h}}\text{Ge})$	0.67	14.5	53p1
$\text{Ge}^{70}(\text{n}, \text{p})$	$\sigma(20^{\text{h}}\text{Ga})$	0.13	14.5	53p1
$\text{Ge}^{72}(\text{n}, \text{p})$	$\sigma(14^{\text{h}}\text{Ga})$	0.065	14.5	53p1
$\text{Ge}^{73}(\text{n}, \text{p})$	$\sigma(5.0^{\text{h}}\text{Ga})$	0.14	14.5	53p1
$\text{Ge}^{74}(\text{n}, \alpha)$	$\sigma(2.2^{\text{h}}\text{Zn})$	0.015	14.5	53p1
$\text{Ge}^{76}(\text{n}, 2\text{n})$	$\sigma(82^{\text{h}}\text{Ge})$	1.80	14.5	53p1
$\text{As}^{75}(\text{n}, \alpha)$	$\sigma(14^{\text{h}}\text{Ga})$	0.012	14.5	53p1
$\text{As}^{75}(\text{n}, 2\text{n})$	$\sigma(17^{\text{d}}\text{As})$	0.54	14.5	53p1
$\text{As}^{75}(\text{n}, \text{p})$	$\sigma(82^{\text{h}}\text{Ge})$	0.012	14.5	53p1
$\text{Se}(\text{n})$	σ_t	graph	0.4 - 3.5	52j2
	σ_t	graph	0.1 - 3	53w2
$\text{Se}^{77}(\text{n}, \text{p})$	$\sigma(40^{\text{h}}\text{As})$	0.045	14.5	53p1
$\text{Se}^{80}(\text{n}, \alpha)$	$\sigma(59^{\text{h}}\text{Se})$	0.038	14.5	53p1
$\text{Se}^{82}(\text{n}, 2\text{n})$	$\sigma(59^{\text{h}}\text{Se})$	1.5	14.5	53p1
$\text{Br}^{79}(\text{n}, 2\text{n})$	$\sigma(6.4^{\text{h}}\text{Br})$	1.10	14.5	53p1
$\text{Br}^{81}(\text{n}, \alpha)$	$\sigma(90^{\text{h}}\text{As})$	0.10	14.5	53p1
$\text{Br}^{81}(\text{n}, 2\text{n})$	$\sigma(4.4^{\text{h}}\text{Br})$	0.83	14.5	53p1
$\text{Rb}^{87}(\text{n}, \alpha)$	$\sigma(33^{\text{h}}\text{Br})$	0.039	14.5	53p1
$\text{Sr}^{84}(\text{n}, \gamma)$	$\sigma(65^{\text{d}}\text{Sr})$	1.2	th	53l2
$\text{Sr}^{88}(\text{n}, \alpha)$	$\sigma(4.4^{\text{h}}\text{Kr})$	0.064	14.5	53p1
$\text{Sr}^{88}(\text{n}, \text{p})$	$\sigma(17.6^{\text{h}}\text{Rb})$	0.018	14.5	53p1
$\text{Y}^{89}(\text{n}, \alpha)$	(19^{d}Rb)	0.070	14.5	53p1
$\text{Zr}(\text{n})$	σ_t	graph	3 - 13	53n1
$\text{Zr}^{90}(\text{n}, \alpha)$	$\sigma(2.8^{\text{h}}\text{Sr})$	0.2	14.5	53p1

Neutron Cross Sections - Continued

Reaction	σ Type	Value	Energy	Ref.
$\text{Zr}^{90}(\text{n}, 2\text{n})$	$\sigma(4.5^{\text{h}}\text{Zr})$	0.08	14.5	53p1
$\text{Zr}^{90}(\text{n}, \text{p})$	$\sigma(61^{\text{h}}\text{Y})$	0.25	14.5	53p1
$\text{Zr}^{94}(\text{n}, \text{p})$	$\sigma(18^{\text{h}}\text{Y})$	0.01	14.5	53p1
$\text{Mo}^{92}(\text{n}, 2\text{n})$	$\sigma(15.5^{\text{h}} + 75^{\text{h}}\text{Mo})$	0.19	14.5	53p1
	$\sigma(15.5^{\text{h}}\text{Mo})$	graph	13 - 27	53b6
$\text{Mo}^{97}(\text{n}, \text{p})$	$\sigma(78^{\text{h}}\text{Nb})$	0.1	14.5	53p1
$\text{Mo}^{100}(\text{n}, 2\text{n})$	$\sigma(68^{\text{h}}\text{Mo})$	3.8	14.5	53p1
$\text{Ru}^{96}(\text{n}, 2\text{n})$	$\sigma(1.6^{\text{h}}\text{Ru})$	0.48	14.5	53p1
$\text{Ru}^{101}(\text{n}, \text{p})$	$\sigma(16^{\text{h}}\text{Tc})$	0.002	14.5	53p1
$\text{Rh}(\text{n})$	σ_s	4.1	0.16 ev	53b4
$\text{Pd}^{104}(\text{n}, \text{p})$	$\sigma(4.3^{\text{h}} + 44^{\text{h}}\text{Rh})$	0.13	14.5	53p1
$\text{Pd}^{105}(\text{n}, \text{p})$	$\sigma(36^{\text{h}}\text{Rh})$	0.7	14.5	53p1
$\text{Pd}^{110}(\text{n}, \alpha)$	$\sigma(4^{\text{h}}\text{Ru})$	0.014	14.5	53p1
$\text{Pd}^{110}(\text{n}, 2\text{n})$	$\sigma(13^{\text{h}}\text{Pd})$	1.9	14.5	53p1
$\text{Ag}^{107}(\text{n}, 2\text{n})$	$\sigma(24.5^{\text{h}}\text{Ag})$	0.5	14.5	53p1
$\text{Ag}^{109}(\text{n}, 2\text{n})$	$\sigma(2.3^{\text{h}}\text{Ag})$	0.3	14.5	53p1
$\text{Cd}(\text{n}, \text{n}')$	$\sigma(49^{\text{h}}\text{Cd})$	0.21	1.27	53f3
	graph		0.4 - 1.3	53f3
$\text{Cd}(\text{n})$	σ_s/σ_a	graph	0.025 - 0.4 ev	53b4
	σ_t	500	0.175 ev	53b4
	σ_t	graph	0.1 - 3	53w2
	σ_t	graph	0.4 - 3.5	52j2
	σ_t	table	37 - 153	53t2
	σ_t	1.84	400	53n2
$\text{Cd}^{110}(\text{n}, \gamma)$	$\sigma(49^{\text{h}}\text{Cd})$	<0.001	0.2 - 0.4	53f3
$\text{Sb}^{121}(\text{n}, 2\text{n})$	$\sigma(16.6^{\text{h}}\text{Sb})$	0.75	14.5	53p1
$\text{Sb}^{123}(\text{n}, 2\text{n})$	$\sigma(2.6^{\text{d}}\text{Sb})$	1.2	14.5	53p1
$\text{Te}(\text{n})$	σ_t	graph	0.1 - 3	53w2
$\text{Te}^{128}(\text{n}, 2\text{n})$	$\sigma(9.3^{\text{h}}\text{Te})$	0.78	14.5	53p1
$\text{Te}^{130}(\text{n}, 2\text{n})$	$\sigma(72^{\text{h}} + 32^{\text{d}}\text{Te})$	0.60	14.5	53p1
$\text{I}^{127}(\text{n}, \alpha)$	$\sigma(21^{\text{h}}\text{Sb})$	0.018	14.5	53p1
$\text{I}^{127}(\text{n}, 2\text{n})$	$\sigma(13.0^{\text{d}}\text{I})$	1.1	14.5	53p1
	graph		12 - 18	53w2
$\text{I}^{127}(\text{n}, \text{p})$	$\sigma(9.3^{\text{h}}\text{Te})$	0.23	14.5	53p1
$\text{I}^{127}(\text{n}, \gamma)$	$\sigma(25^{\text{h}}\text{I})$	graph	0.25 - 1.6	53m4
$\text{Ba}^{138}(\text{n}, \text{p})$	$\sigma(33^{\text{h}}\text{Cs})$	0.006	14.5	53p1
$\text{Ba}^{138}(\text{n}, \gamma)$	$\sigma(58^{\text{h}}\text{Ba})$	0.053	~25 kev	53k4
$\text{La}^{139}(\text{n}, \text{p})$	$\sigma(85^{\text{h}}\text{Ba})$	0.006	14.5	53p1

Neutron Cross Sections - Continued

Reaction	σ Type	Value	Energy	Ref.
Ce ¹⁴⁰ (n, α) σ (2.6 ^m Ba)		0.012	14.5	53p1
Pr ¹⁴¹ (n, 2n) σ (3.6 ^m Pr)		2.1	14.5	53p1
Sm ¹⁵² (n, α) σ (1.7 ^h Nd)		0.009	14.5	53p1
Sm ¹⁵⁴ (n, 2n) σ (4.7 ^h Sm)		0.22	14.5	53p1
Sm ₂ O ₃ (n) σ_s/σ_a	graph	0.025 - 0.16 ev	53b4	Single level indicated
Eu ₂ O ₃ (n) σ_s/σ_a	graph	0.025 - 0.16 ev	53b4	
Gd ¹⁶⁰ (n, 2n) σ (18.0 ^h Gd)		1.5	14.5	53p1
Gd ₂ O ₃ (n) σ_s/σ_a	graph	0.025 - 0.16 ev	53b4	Two levels indicated
Dy ₂ O ₃ (n) σ_s/σ_a	graph	0.025 - 0.13 ev	53b4	
Hf(n) σ_{el}		4.7	1.0	53w3
Ta ¹⁸¹ (n, 2n) σ (8.0 ^h Ta)		0.9	14.5	53p1
W ¹⁸⁶ (n, γ) σ (24 ^h W)		0.12	25 kev	53k4
Pt(n) σ_t	graph	0.1 - 3	53w2	
Pt ¹⁹⁸ (n, 2n) σ (18 ^h Pt)		3	14.5	53p1
Au(n) σ_t	graph	0.1 - 3	53w2	
	σ_t	5.1	14	53a1
Au ¹⁹⁷ (n, 2n) σ (5.6 ^d Au)		1.7	14.5	53p1
Hg(n) σ_t	graph	0.1 - 3	53w2	
	σ_t	graph	0.4 - 3.5	52j2
	σ_t	5.3	14	53a1
Tl ²⁰⁵ (n, p) σ (5.6 ^m Hg)		0.003	14.5	53p1
Pb(n) σ_{el}		4.6	1.0	53w3
Pb(n, n') σ (~3.5 Mev γ 's)		~0.3	14	53b5
	σ (~2.5 Mev γ 's)	~4	14	53b5
Pb(n) σ_t	graph	3 - 13	53n1	
	σ_t	5.8	14	53a1
	σ_t	4.22	55	53r2
	σ_t	4.87	85	53r2
	σ_t	table	37 - 153	53t2
	σ_t	2.88	400	53n2
Pb ²⁰⁸ (n, p) σ (3.1 ^m Tl)		0.001	14.5	53p1
Bi(n) σ_{el}		4.8	1.0	53w3
	σ_t	graph	3 - 13	53n1
	σ_t	5.4	14	53a1
Bi ²⁰⁹ (n, α) σ (4.2 ^m Tl)		0.001	14.5	53p1
Ac ²²⁷ (n) σ_a		500	th	52p3
Th(n) σ_t	graph	0.1 - 3	53w2	
	σ_t	3.23	400	53n2

Neutron Cross Sections - Continued

Reaction	σ Type	Value	Energy	Ref.
Th ²³⁰ (n) σ_a		30 - 60	pile	49h1
Pa ²³⁰ (n) σ_a		~1500	pile	47g1
Pa ²³¹ (n, $\gamma\beta^-$) σ (70 ^y U)		290	pile	53e3
Pa ²³² (n, γ) σ (27.4 ^d Pa)		~40	pile	53e3
U(n) σ_t		graph	3.7 - 800ev	53h5
	σ_t	graph	3 - 13	53n1
	σ_t	3.26	400	53n2
U ²³² (n) σ_a		< 500	pile	53e1
U ²³² (n, f) σ_f		~80	th	53e1
47g1 A. Ghiorso, M. H. Studier, E. K. Hyde, priv. comm. Value assuming $\epsilon/\beta^-(Pa^{230}) = 11.5$.				
49h1 E. K. Hyde, A. H. Jaffey, priv. comm.				
52h5 E. R. Hodgson, J. F. Gallagher, E. M. Bowey, Proc. Phys. Soc. 65A, 992(1952).				
52j2 C. H. Johnson, H. B. Willard, J. K. Bair, J. O. Kington, ORNL-1365, 1(1952).				
52p3 H. Pomerance, ORNL-1415, 15(1952).				
53a1 M. Ageno, G. Cortelllessa, R. Querzoli, Nuovo Cim. 10, 281(1953).				
53b2 R. M. Bartholomew, R. C. Hawkins, W. F. Merritt, L. Yaffe, Can. J. Chem. 31, 204(1953). Based on $\sigma_a(Au) = 93$.				
53b4 B. N. Brockhouse, Can. J. Phys. 31, 432(1953).				
53b5 M. E. Battat, R. W. Davis, A. H. Frentrop, LA-1507(1953).				
53b6 J. E. Broilley, Jr., Phys. Rev. 89, 877(1953); 88, 618(1952).				
53c3 J. P. Conner, Phys. Rev. 89, 712(1953).				
53e1 R. Elson, W. Bentley, A. Ghiorso, Q. VanWinkle, Phys. Rev. 89, 320(1953).				
53e3 R. Elson, P. A. Sellers, E. R. John, Phys. Rev. 90, 102(1953). Based on $\sigma(Np^{237}) = 172$.				
53f2 R. E. Fields, R. L. Becker, R. K. Adair, Phys. Rev. 89, 908A(1953).				
53f3 A. E. Francis, J. J. G. McCue, C. Goodman, Phys. Rev. 89, 1232(1953).				
53h3 E. M. Hafner, W. F. Hornyak, C. E. Falk, G. Snow, T. Coor, Phys. Rev. 89, 204(1953).				
53h5 E. Hellstrand, R. Persson, Arkiv Fysik 6, 57(1953).				
53k4 C. Kimball, B. Hamermesh, Phys. Rev. 89, 1306(1953).				
53l1 E. E. Lockett, E. Bowell, Phys. Rev. 89, 657(1953). Based on $\sigma_a(B) = 710$.				
53l2 W. S. Lyon, Phys. Rev. 89, 1307(1953). Based on $\sigma_a(Mn) = 13$.				
53m4 H. C. Martin, R. F. Taschek, Phys. Rev. 89, 1302(1953).				
53n1 N. Nereson, S. Darden, Phys. Rev. 89, 775(1953).				
53n2 V. A. Nedzel, Phys. Rev. 90, 169(1953).				
53p1 E. B. Paul, R. L. Clarke, Can. J. Phys. 31, 267(1953).				
53r1 B. Rose, J. M. Freeman, Proc. Phys. Soc. 66A, 120(1953).				
53r2 B. Ragent, W. L. Linnor, BAPS 28, 3, D3(1953).				
53a1 M. Ageno, G. Cortelllessa, R. Querzoli, Nuovo Cim. 10, 281(1953).				
53s2 W. E. Scherrer, R. Theus, W. R. Faust, Phys. Rev. 89, 1268(1953).				
53t2 A. E. Taylor, E. Wood, Phil. Mag. 44, 95(1953).				
53w2 W. Wait, R. L. Becker, A. Okazaki, R. E. Fields, Phys. Rev. 89, 1271(1953).				
53w3 W. Wait, H. H. Barschall, BAPS 28, 3, D9(1953).				

GROUND STATE Q'S

Reaction	Standard	Value	Method	Ref.
$\text{Li}^6(p,\alpha)\text{He}^3$	absolute	$+4.023 \pm 0.003$	s	53c1
$\text{Li}^6(d,\alpha)\text{He}^4$	absolute	$+22.396 \pm 0.012$	s	53c1
$\text{Li}^6(d,p)\text{Li}^7$	absolute	$+5.028 \pm 0.003$	s	53c1
$\text{Li}^7(p,\alpha)\text{He}^4$	absolute	$+17.352 \pm 0.009$	s	53c1
$\text{Be}^9(p,\alpha)\text{Li}^6$	absolute	$+2.126 \pm 0.003$	s	53c1
$\text{Be}^9(d,\alpha)\text{Li}^7$	absolute	$+7.153 \pm 0.004$	s	53c1
$\text{Be}^9(p,d)\text{Be}^8$	absolute	$+0.560 \pm 0.003$	s	53c1
$\text{Be}^9(d,t)\text{Be}^8$		$+4.60 \pm 0.03$	dpl	52c2
$\text{B}^{10}(n,\alpha)\text{Li}^7$	$\text{Po}^{212} \alpha$	$+2.781 \pm 0.025$	pc	52h7
$\text{B}^{10}(d,\alpha)\text{Be}^8$	Bi^{212} $\text{Po}^{212} \alpha$	$+17.91 \pm 0.08$	1c	53t3
$\text{B}^{11}(p,\alpha)\text{Be}^8$	absolute	$+8.589 \pm 0.005$	s	53c1
$\text{N}^{14}(d,n)\text{O}^{15}$		$+5.15 \pm 0.16$	dpl	53e2
$\text{N}^{14}(\alpha,p)\text{O}^{17}$		-1.16	dpl	53h4
$\text{N}^{15}(p,\alpha)\text{C}^{12}$	absolute	$+4.962 \pm 0.004$	s	53c1
$\text{Na}^{23}(p,\alpha)\text{Ne}^{20}$	$\text{Li}^7(p,n)$	$+2.379 \pm 0.003$	EA	53d1
$\text{Mg}^{24}(p,\gamma)\text{Al}^{25}$	$\text{F}(p,\alpha)$	$+2.32 \pm 0.10$	scin	53c2
$\text{Mg}^{24}(d,n)\text{Al}^{25}$		$+0.07 \pm 0.06$	dpl	53g2
$\text{Mg}^{26}(p,\gamma)\text{Al}^{27}$	$\text{F}(p,\alpha)$	$+8.3 \pm 0.4$	scin	53c2
$\text{Al}^{27}(p,\alpha)\text{Mg}^{24}$	$\text{Li}^7(p,n)$	$+1.594 \pm 0.002$	EA	53d1
$\text{Al}^{27}(p,n)\text{Si}^{27}$	$\text{F}^{19}(p,\alpha\gamma)$	-5.61 ± 0.01	thresh	53k1
$\text{S}^{32}(d,n)\text{Cl}^{33}$		$+0.25 \pm 0.07$	dpl	53m2
$\text{S}^{32}(\alpha,p)\text{Cl}^{35}$		-2.02 ± 0.11	dpl	52f2
Mass (S^{32})/Mass (S^{34})		1.06242	M1c	53b3
$\text{Cl}^{35}(n,\alpha)\text{P}^{32}$		$+1.07 \pm 0.15$	1c	52f2
$\text{Sc}^{45}(n,\gamma)\text{Sc}^{46}$	absolute	$+8.85 \pm 0.08$	pair s	53b1
$\text{Ti}^{47}(n,\gamma)\text{Ti}^{48}$	absolute	$+9.39 \pm 2.31 ?$	pair s	53k2
$\text{Ti}^{48}(n,\gamma)\text{Ti}^{49}$	absolute	$+6.76 \pm 1.35 ?$	pair s	53k2
$\text{Ti}^{49}(n,\gamma)\text{Ti}^{50}$	absolute	$+9.19 \pm 1.58 ?$	pair s	53k2
$\text{V}^{51}(n,\gamma)\text{V}^{52}$	absolute	$+7.305 \pm 0.007$	pair s	53b1
$\text{Cr}^{52}(d,p)\text{Cr}^{53}$		$+5.70$	s	53m1
$\text{Cr}^{52}(n,\gamma)\text{Cr}^{53}$	absolute	$+7.929 \pm 0.008$	s	53k2
$\text{Cr}^{53}(n,\gamma)\text{Cr}^{54}$	absolute	$+9.716 \pm 0.008$	s	53k2
$\text{Mn}^{55}(n,\gamma)\text{Mn}^{56}$	absolute	$+7.261 \pm 0.006$	pair s	53b1

Ground State Q's - Continued

Reaction	Standard	Value	Method	Ref.
$\text{Fe}^{54}(n,\gamma)\text{Fe}^{55}$	absolute	$+9.298 \pm 0.007$	pair s	53k2
$\text{Fe}^{56}(n,\gamma)\text{Fe}^{57}$	absolute	$+7.639 \pm 0.004$ (+0, 0.014, or 0.13)	pair s	53k2
$\text{Fe}^{57}(n,\gamma)\text{Fe}^{58}$	absolute	$+10.16 \pm 0.04$	pair s	53k2
$\text{Co}^{59}(n,\gamma)\text{Co}^{60}$	absolute	$+7.486 \pm 0.009$	pair s	53b1
$\text{Ni}^{58}(d,p)\text{Ni}^{59}$		$+6.77$	dpl	53m1
$\text{Ni}^{58}(n,\gamma)\text{Ni}^{59}$	absolute	$+8.997 \pm 0.005$	pair s	53k2
$\text{Ni}^{60}(n,\gamma)\text{Ni}^{61}$	absolute	$+8.532 \pm 0.008$	pair s	53k2
$\text{Cu}^{63}(n,\gamma)\text{Cu}^{64}$	absolute	$+7.914 \pm 0.004$	pair s	53b1
$\text{Cu}^{65}(n,\gamma)\text{Cu}^{66}$	absolute	$+7.634 \pm 0.006?$ See Cu^{66}	pair s	53b1
$\text{Zn}^{65}(n,\gamma)\text{Zn}^{66}$	absolute	$+7.876 \pm 0.007$	pair s	53k2
$\text{Zn}^{67}(n,\gamma)\text{Zn}^{68}$	absolute	$+9.51 \pm 0.03 ?$	pair s	53k2
$\text{Sr}^{88}(d,p)\text{Sr}^{89}$		$+4.33 \pm 0.10$	s	53m1
$\text{Mo}^{92}(\gamma,n)\text{Mo}^{91}$	--	-13.1 ± 0.1	thresh	53k3
$\text{Mo}^{92}(n,2n)\text{Mo}^{91}$	--	-12.34	thresh	53b6
$\text{Pb}^{206}(d,t)\text{Pb}^{205}$	$\text{Al}^{27}(d,p)$	-1.8 ± 0.1	range	53h6
$\text{Pb}^{206}(d,p)\text{Pb}^{207}$	$\text{Al}^{27}(d,p)$	$+4.48 \pm 0.06$	range	53h6
$\text{Pb}^{207}(d,t)\text{Pb}^{206}$	$\text{Al}^{27}(d,p)$	-0.42 ± 0.05	range	53h6
$\text{Pb}^{207}(d,p)\text{Pb}^{208}$	$\text{Al}^{27}(d,p)$	$+5.14 \pm 0.05$	range	53h6
$\text{Pb}^{208}(d,t)\text{Pb}^{207}$	$\text{Al}^{27}(d,p)$	-1.10 ± 0.05	range	53h6
$\text{Pb}^{208}(d,p)\text{Pb}^{209}$	$\text{Al}^{27}(d,p)$	$+1.65 \pm 0.05$	range	53h6
52c2	J. Catalá, F. Senent, S. Casanova, <i>Anales real soc. españ. fis. y quim.</i> 48A, 323(1952).			
52f2	A. Folkleraki, <i>Proc. Phys. Soc.</i> 65A, 1006(1952).			
52h7	U. A. Hauser, <i>Z. Naturf.</i> 7a, 781(1952).			
53b1	G. A. Bartholomew, B. B. Kinsey, <i>Phys. Rev.</i> 89, 386(1953).			
53b3	G. R. Bird, R. C. Mockler, <i>BAPS</i> 28, 2, J7(1953).			
53b6	J. E. Brolley, Jr., <i>Phys. Rev.</i> 89, 877(1953); 88, 618(1952). Based on $\sigma_a(\text{Cu}^{65}) = 2.1$.			
53c1	E. R. Collins, C. D. McKenzie, C. A. Ramm, <i>Proc. Roy. Soc.</i> 216A, 242(1953).			
53c2	H. Casson, <i>Phys. Rev.</i> 89, 809(1953).			
53d1	D. J. Donahue, K. W. Jones, M. T. McEllistrem, H. J. Richards, <i>Phys. Rev.</i> 89, 824(1953).			
53e2	W. H. Evans, T. S. Green, R. Middleton, <i>Proc. Phys. Soc.</i> 66A, 108(1953).			
53g2	E. Goldberg, <i>Phys. Rev.</i> 89, 760(1953).			
53h4	E. Hjalmar, H. Siitla, <i>Phys. Rev.</i> 89, 1151(1953).			
53h6	J. A. Harvey, <i>Can. J. Phys.</i> 31, 278(1953).			
53k1	J. D. Kington, J. K. Bair, R. R. Carlson, H. B. Willard, <i>Phys. Rev.</i> 89, 530(1953).			
53k2	B. B. Kinsey, G. A. Bartholomew, <i>Phys. Rev.</i> 89, 375(1953). Isotopic assignments from various arguments. See notes under product nuclei.			
53k3	L. Katz, R. G. Baker, R. Montalbetti, <i>Can. J. Phys.</i> 31, 250(1953).			
53m1	C. E. McFarland, F. B. Shull, <i>Phys. Rev.</i> 89, 489(1953).			
53m2	R. Middleton, F. A. El-Bedawi, C. T. Tai, <i>Proc. Phys. Soc.</i> 66A, 95(1953).			
53t3	P. B. Treacy, <i>Phil. Mag.</i> 44, 325(1953).			

PACKING FRACTION DIFFERENCES

 Δf , in Units 10^{-4} amu

Doublet	Δf	Ref.
$H_2 - D$	$+ 7.746 \pm 0.004$	53o1
$He^4 - D_2$	-64.01 ± 0.02	53o1
$B^{10} - Ne^{20}$	$+16.722 \pm 0.008$	53o1
$B^{10}H - B^{11}$	$+10.41 \pm 0.01$	53o1
$B^{10}D - C^{12}$	$+22.51 \pm 0.02$	53o1
$B^{10}F^{19} - C^{13}O^{16}$	$+ 4.500 \pm 0.005$	53o1
$B^{10}HF^{19} - B^{11}F^{19}$	$+ 3.817 \pm 0.005$	53o1
$B^{11} - Ne^{22}$	$+12.382 \pm 0.007$	53o1
$B^{11}H - C^{12}$	$+14.262 \pm 0.005$	53o1
$B^{11}F^{19} - Si^{30}$	$+11.316 \pm 0.007$	53o1
$C^{12} - D_3$	$+70.50 \pm 0.02$	53o1
$C^{12}H_4 - O^{16}$	$+22.759 \pm 0.005$	53o1
$C^{12}H_4 - C^{12}O^{16}$	$+13.008 \pm 0.003$	53o1
$C^{12}C^{13}H - C^{12}H_3$	$- 1.661 \pm 0.004$	53o1
$C^{13}O^{16} - Si^{29}$	$+ 7.517 \pm 0.008$	53o1
$C^{13}O^{16} - B^{10}F^{19}$	$- 4.500 \pm 0.005$	53o1
$N^{14} - C^{12}H_2$	$- 8.989 \pm 0.004$	53o1
$N^{14} - C^{12}H_4$	$- 8.986 \pm 0.004$	53o1
$N^{14} - C^{12}O^{16}$	$+ 4.019 \pm 0.003$	53o1
$N^{15} - C^{12}H_3$	-15.585 ± 0.004	53o1
$H_2O^{18} - D_2O^{16}$	$- 4.15 \pm 0.01$	53o1
$B^{10}F^{19} - C^{13}O^{16}$	$+ 4.500 \pm 0.005$	53o1
$B^{11}F^{19} - Si^{30}$	$+11.316 \pm 0.007$	53o1
$Ne^{20} - B^{10}$	-16.722 ± 0.008	53o1
$Ne^{20} - D_2O^{16}$	-15.355 ± 0.008	53o1
$Ne^{22} - B^{11}$	-12.382 ± 0.007	53o1
$Al^{27} - C^{12}H_3$	-15.561 ± 0.007	53o1
$Si^{28} - C^{12}O^{16}$	$- 6.435 \pm 0.005$	53o1
$Si^{29} - C^{13}O^{16}$	$- 7.517 \pm 0.008$	53o1
$Si^{30} - B^{11}F^{19}$	-11.316 ± 0.007	53o1
$P^{31}H - S^{32}$	$+ 2.969 \pm 0.003$	53o2
$P^{31}H_2 - S^{32}H$	$+ 2.876 \pm 0.004$	53o2
$P^{31}H - O^{16}_2$	$- 2.577 \pm 0.004$	53o2
$S^{32} - P^{31}H$	$- 2.969 \pm 0.003$	53o2
$S^{32}H - P^{31}H_2$	$- 2.876 \pm 0.004$	53o2
$S^{32} - O^{16}_2$	$- 5.539 \pm 0.003$	53o1
$S^{32}H_2 - S^{34}$	$+ 5.837 \pm 0.008$	53o1

Packing Fraction Differences, Δf , in Units 10^{-4} amu
(continued)

Doublet	Δf	Ref.
$S^{32}O^{16} - C^{12}_4$	$- 6.900 \pm 0.005$	53o1
$S^{33}H_2 - S^{34}H$	$+ 3.250 \pm 0.009$	53o1
$S^{34}H_2 - C^{12}_3$	$- 4.596 \pm 0.008$	53o1
$HCl^{35} - C^{12}_3$	$- 6.479 \pm 0.003$	53o1
$Cl^{37} - C^{12}_3H$	-11.352 ± 0.004	53o1
$HCl^{37} - C^{12}_3H_2$	-11.053 ± 0.004	53o1
$A^{40} - D_2O^{16}$	-20.959 ± 0.007	53o1
$A^{40} - C^{12}_3H_4$	-17.234 ± 0.007	53o1
$Zr^{92} - W^{184}$	-7.59 ± 0.02	53g1
$Zr^{94} - Os^{188}$	-7.59 ± 0.01	53g1
$Zr^{96} - Os^{192}$	-7.48 ± 0.02	53g1
$Mo^{92} - W^{184}$	-7.44 ± 0.02	53g1
$Mo^{94} - Os^{188}$	-7.72 ± 0.02	53g1
$Mo^{96} - Os^{192}$	-7.86 ± 0.01	53g1
$Ru^{96} - Os^{192}$	-7.55 ± 0.02	53g1
$Ru^{102} - Pb^{204}$	-8.02 ± 0.03	52h7
$Ru^{104} - Pb^{208}$	-7.96 ± 0.01	52h7
$Rh^{103} - Pb^{206}$	-7.94 ± 0.01	52h7
$Pd^{102} - Pb^{204}$	-7.94 ± 0.04	52h7
$Pd^{104} - Pb^{208}$	-8.05 ± 0.01	52h7
$W^{184} - Zr^{92}$	$+7.59 \pm 0.02$	53g1
$W^{184} - Mo^{92}$	$+7.44 \pm 0.02$	53g1
$Os^{188} - Zr^{94}$	$+7.59 \pm 0.01$	53g1
$Os^{188} - Mo^{94}$	$+7.72 \pm 0.02$	53g1
$Os^{192} - Zr^{96}$	$+7.48 \pm 0.02$	53g1
$Os^{192} - Mo^{96}$	$+7.86 \pm 0.01$	53g1
$Os^{192} - Ru^{96}$	$+7.55 \pm 0.02$	53g1
$Pb^{204} - Ru^{102}$	$+8.02 \pm 0.03$	52h7
$Pb^{204} - Pd^{102}$	$+7.94 \pm 0.04$	52h7
$Pb^{206} - Rh^{103}$	$+7.94 \pm 0.01$	52h7
$Pb^{208} - Ru^{104}$	$+7.96 \pm 0.01$	52h7
$Pb^{208} - Pd^{104}$	$+8.05 \pm 0.01$	52h7

52h7 B.G.Hogg, M.E.Duckworth, Can. J. Phys. 30, 637(1952).

53g1 J.S.Gelger, B.G.Hogg, M.E.Duckworth, J.W.Dewdney, Phys. Rev. 89, 621(1953).

53o1 K.Ogata, H.Matsuda, Phys. Rev. 89, 27(1953).

53o2 K.Ogata, H.Matsuda, Phys. Rev. 89, 333(1953).

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